HSL No. 74-7
MAY 31, 1974

THIS ISSUE CONTAINS:

HS–013 946–955; HS–013 974–HS–014 086
HS–800 975; 991
HS–801 008; 010–013; 018–020; 028–034; 040–047
HS–820 194; 302

U.S. Department of Transportation
National Highway Traffic Safety Administration

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...A MONTHLY ABSTRACT JOURNAL

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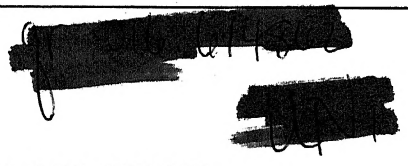

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A document containing several articles is announced as a complete volume under an HS number referring to it as a whole. Entries for selected individual articles are listed under their own HS numbers.

SAMPLE ENTRIES

JOURNAL ENTRY

Title of Document: **EFFECTS OF EXPERIENCE OF THE DRIVER ON HEART-RATE, RESPIRATION-RATE, AND SUBSIDIARY REACTION TIME IN A THREE HOURS CONTINUOUS DRIVING TASK**

Journal Citation: Ergonomics v16 n4 p501-6 (Jul 1973)

Author(s): H. O. Lisper, H. Laurell, G. Stening 1973 13refs
See serial citation

Search Terms: Heart rate, Respiratory rate, Driver experience, Driver monitoring, Driving task analysis, Driver fatigue, Test volunteers, Driver reaction time, Tracking

Abstract: From accident statistics a difference was hypothesized between experienced and inexperienced drivers in vulnerability to continuous driving. This difference was used as a basis for a comparison of changes in autonomic measures and reaction time over driving time. The result showed significant effects of experience on both types of measures. Heart rate pointed to experienced and reaction time pointed to inexperienced drivers as being the most vulnerable to continuous driving. This contradiction was solved with reference to statistical data and validation of the reaction time task. Thus in this study reaction time was preferred to the autonomic measures.

NHTSA Accession Number: HS-013 826

CONTRACT REPORT

WET TRACTION TEST PROGRAM. FINAL REPORT

Corporate author: Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
R. E. Wild 1973 55p 1ref Rept. No. HSRI-PF-73-3
Contract DOT-HS-031-2-283

Availability: NTIS

Tire traction, Wet road conditions, Tire tests, Tire pavement interface, Statistical analysis, Skid resistance tests, Coefficient of friction, Tire force measurement, Tire diameters, Tire sizes, Tire grading, Asphalt pavements, Concrete pavements

Eighty-six tires were measured for longitudinal and lateral traction capability on jennite, asphalt, and concrete wetted surfaces. The resulting data were subjected to a simple but thorough statistical analysis. Findings of general interest emerged showing the fallibility of the skid number for characterizing a tire pavement combination, the independent nature of lateral traction with respect to longitudinal traction, and indications of the effects on traction of tire diameter and load rating. Traction uniformity on concrete between identical tires was found to be excellent, while the traction differences on concrete between tires of the same size but of different manufacture were found to be statistically significant.

HS-800 917

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HS-013 946

TECHNICAL PRESENTATIONS. PT. 5. THE UNITED STATES TECHNICAL PRESENTATION

The United States presentations are by the Office of the Secretary of Transportation, Dynamic Science, GM Technical Center, Ford Motor Co., American Machine and Foundry, Inc., and the National Highway Traffic Safety Administration (NHTSA). NHTSA and Dynamic Science reports on ESV tests including results of vehicle and dummy performance. General Motors Corporation reports summarily on their ESV prototypes drawing conclusions and making projections. Ford Motor Company compares their ESV, presently being tested, with a production Ford. Also discussed is their crash test program (impact with stationary and moving objects). The American Machine and Foundry, Inc. (AMF), discusses the ESV tradeoff and integration studies program taking into account the interior, front end, body structure, systems, simulator, subsystems and producibility. AMF also presents a study on crashworthiness-weight tradeoff including their current ESV trade studies and a structural-design concept for the optimized vehicle. NHTSA reviews the preliminary specifications for a 3,000 lb ESV.

by W. Steber; N. Stahler; L. C. Lundstrom; J. D. Collins; A. L. Roth; W. Rup; W. Wingenbach; W. E. Scott
HS-013 939, International Technical Conference on Experimental Vehicles (4th), Washington, 1973 p277-331
1973 ;
Availability: In HS-013 939

HS-013 947

TECHNICAL PRESENTATIONS. PT. 6. THE SWEDISH TECHNICAL PRESENTATION

Technical presentations by Sweden are presented: National Traffic Safety Agency, AB Volvo, and Saab-Scania. AB Volvo discusses steerability during emergency braking including accident investigation, simulation testing by a mathematical model, field performance tests and field statistical tests. Volvo also discusses chassis parameter influence on handling characteristics and computer simulations for the Volvo ESV; presents a progress report on the air bag development for the Volvo ESV; and gives a statistical analysis of accident data of Volvo vehicles based on a 12 month period in Sweden completed in 1972. Saab-Scania presents an evaluation of road accident data collected from 5/1/71-4/30/72 and 9/1/72-11/30/72, a total of 1523 of which 158 were in-depth investigations.

by G. Ekberg; S. Rundkvist; F. Jaksch; O. Saxmark; A. Asberg; H. Gustavsson
HS-013 939, International Technical Conference on Experimental Vehicles (4th), Washington, 1973 p333-407
1973 ;
Availability: In HS-013 939

HS-013 948

TECHNICAL PRESENTATIONS. PT. 7. THE ITALIAN TECHNICAL PRESENTATION

The Experimental Institute for Motor Vehicles conducted an investigation to determine the amplitude and intensity of the vibrations found in a motor vehicle. Alpha-Romeo reports recent experiments with mathematical models of the driver/vehicle system involving maximum steering angle, and of a study of occupant restraint systems in a frontal impact against a rigid barrier. An update of analysis of road accidents involving Fiat-built cars is concerned with acceleration, steering and braking on prototype vehicles weighing 1500 to 2500 pounds.

by A. Sirignano; F. Moscarini; L. Chidini; L. R. Rossini; A. Schieppati; M. Garetti; C. B. Anderloni; V. Montanari
HS-013 939, International Technical Conference on Experimental Vehicles (4th), Washington, 1973 p409-475
1973 ;
Availability: In HS-013 939

HS-013 949

ACCIDENT AVOIDANCE SEMINAR. PT. 1. INTRODUCTION. PT. 2. STEERING, HANDLING AND BRAKING

Papers are presented by: Saab-Scania of Sweden speaking on considerations concerning accident avoidance requirements; Toyota Motor Company of Japan remarking on vehicle handling; Daimler-Benz of Germany commenting on American ESV accidents; Girling Ltd. of Great Britain discussing American ESV brake specifications; Citroen Automobiles of France remarking on vehicle antilock systems; General Motors Corporation of the United States, Alfa Romeo of Italy, Girling Ltd. of Great Britain, and Daimler-Benz of Germany speaking of safety aspects of vehicle handling.

by Anonymous
HS-013 939, International Technical Conference on Experimental Vehicles (4th), Washington, 1973 p493-529
1973 ; refs
Availability: In HS-013 939

HS-013 950

ACCIDENT AVOIDANCE SEMINAR. PT. 3. VISIBILITY, LIGHTING AND DRIVER ENVIRONMENT

The Japan Automobile Research Institute of Japan and Adam Opel of Germany were participants in this seminar. The relationship of visibility to crashworthiness is considered, with emphasis on the need for world wide participation in any changes to be made in vehicle lighting. Comments are made on a polarized headlamp system.

by Anonymous
HS-013 939, International Technical Conference on Experimental Vehicles (4th), Washington 1973 p531-535
1973 ;
Availability: In HS-013 939

HS-013 951

CRASHWORTHINESS SEMINAR. PT. 1. INTRODUCTION. PT. 2. TECHNICAL PRESENTATIONS

The crashworthiness seminar includes technical presentations by: U. S. Department of Transportation on the 3,000-lb ESV specification; Volkswagenwerke on simulation of road traffic

accidents with barrier impact tests; Renault State-Owned Works on a method for analyzing collision speeds in real accidents; Nissan Motor Company on the efficiency of body energy absorption and passenger protection devices; the Transport and Road Research Laboratory on their work; Fiat SPA comments on the ESV program; Nissan Motor Company on motor vehicle accidents in Japan; Ford Motor Company comments on 3,000-lb vehicle specification; Accident and Motor Traffic Insurers on pedestrian protection; General Motors Corporation on occupant protection in car-to-car impacts; and the National Highway Traffic Safety Administration on car-to-car compatability.

by G. M. Mackay; G. G. Mannella; U. W. Seiffert; P. Ventre; T. Maeda; R. D. Lister; V. Montanari; Y. Serizawa; C. R. Briggs; M. Danner; R. G. Fischer; E. M. Chandler
HS-013 939, International Technical Conference on Experimental Vehicles (4th), Washington, 1973 p537-591
1973 ; refs
Availability: In HS-013 939

HS-013 952

FUTURE SAFETY STANDARDS AND THE ESV PROGRAM. PT. 1. THE UNITED STATES PRESENTATION

An overview of the National Highway Traffic Safety Administration Program is presented. In addition to the ESV programs, the Research Institute is concerned with vehicle systems' performance, driver performance, crash survivability and human tolerance factors as part of the involvement in research associated with the total traffic system.

by G. G. Mannella
HS-013 939, International Technical Conference on Experimental Vehicles (4th), Washington, 1973 p593-598
1973 ;
Availability: In HS-013 939

HS-013 953

FUTURE SAFETY STANDARDS AND THE ESV PROGRAM. PT. 2. THE PRESENTATIONS BY THE COMMITTEE OF COMMON MARKET CONSTRUCTORS (CCMC)

The University of Birmingham presents field studies of traffic accidents in Europe. Deaths and injuries in road accidents in 1970 are used for statistics. Data are analyzed by class of road user and fatalities, impact types, and injury severity by equivalent test type. How field accident studies can be used as an aid to defining appropriate specifications for crash performance is illustrated. The Peugeot-Renault Association discusses the efficiency of 3-point belt in real accidents, medical as well as technical data is presented and conclusions are drawn as to the efficacy of seat belts. The Verbandes der Automobilindustrie concludes that further investigation is needed in the area of biomechanical research, evaluation of accident statistics, better testing methods, and creation of valid principles for multipurpose profit/cost analyses in vehicle and traffic safety.

by M. Quin; G. M. Mackay; C. Tarriere; G. Brenken
HS-013 939, International Technical Conference on Experimental Vehicles (4th), Washington, 1973 p599-621
1973 ; refs
Availability: In HS-013 939

HS-013 954

FUTURE SAFETY STANDARDS AND THE ESV PROGRAM. PT. 3. THE JAPANESE PRESENTATION

The Ministry of Transport (Japan) talks about future safety standards for Japan. Future standards should include measures to avoid accidents, measures to reduce casualties, and fire prevention measures. An extensive chart showing the proposed program of future research including proposed fiscal accomplishment year is included.

by H. Kageyama
HS-013 939, International Technical Conference on Experimental Vehicles (4th), Washington, 1973 p623-633
1973 ;
Availability: In HS-013 939

HS-013 955

CONCLUSION OF INTERNATIONAL TECHNICAL CONFERENCE ON EXPERIMENTAL SAFETY VEHICLES (4TH). PART 1. CLOSING ADDRESS

Hisashi Kagayama of the Motor Vehicle Department, Ministry of Transport, expressed his hope that the ESV will contribute to vehicular safety and assist in combating environmental problems created by the automobile. He expressed special thanks to the U.S. Government for making the conference possible and thanked all other delegates for their participation. Dr. Gene G. Mannella of the Research Institute, National Highway Traffic Safety Administration expressed his belief that the differences of opinion represented at the conference were constructive and that the lasting contribution of these conferences is the improvement and enhancement of the willingness to discuss and resolve differences of opinion.

by By H. Kageyama; G. G. Mannella
HS-013 939, International Technical Conference on Experimental Vehicles (4th), Washington 1973 p635-639
1973 ;
Availability: In HS-013 939

HS-013 974

ILLUMINANCE VERSUS LUMINANCE

The paper gives a short history of the efforts of researchers during the past 50 years in the area of pavement illumination versus luminance. Illumination is the measure of the amount of light flux falling on a surface and is independent of the direction from which the light comes, the number of light sources or their positions, the type of light source, and they type of surface on which it falls. Luminance is a measure of the amount and concentration of light flux leaving a surface and is the light by which an object is seen. It is dependent on the qualities of which illumination is independent. Current specifications for highway lighting concern illumination and not luminance, although luminance parameters are important to roadway visibility. Thus, there is need for further study involving collection of data on reflectances, roadway surfaces in

all weather, and interaction between fixed and vehicular-mounted lighting to allow the engineer to design a lighting system most appropriate to specific surfaces.

by L. E. King
Highway Research Board Special Report n134 p10-8 (1973)
1973 ; 20refs
Includes discussions by J.S. Franklin and A. Ketvirtis.
Availability: See serial citation

HS-013 975

MINIMIZING THE HAZARD OF RESTRICTED VISIBILITY IN FOG

The nature of fog and its formation, effects of fog on driving and accidents, current fog abatement techniques, and possible guidance systems to aid drivers in minimizing the hazards encountered in fog are briefly described.

by R. N. Schwab
Highway Research Board Special Report n134 p19-27 (1973)
1973 ; 12refs
Includes discussion by W. H. Heiss and D. Hofstetter, and author's closure.
Availability: See serial citation

HS-013 976

REVIEW OF VISIBILITY FACTORS IN ROADWAY SIGNING

Sign performance is dependent on attention value and legibility. Reviews of relevant factors are presented. Studies of sign legibility have served to identify such factors as letter-to-background contrast, letter height, height-width ratio, stroke width, spacing between letters and vertical spacing between lines. Other areas discussed include legibility distances for highway sign design (human factors engineering), lowercase letters and familiarity effects, effect of letter brightness on legibility, contrast, glance legibility, letter size calculation, sign visibility against background, angular position, luminance characteristics, signs as a communications technique, freeway signing, urban signing, pavement marking, delineation, and diagrammatic signs. Discussion on the review is presented.

by H. L. Woltman
Highway Research Board Special Report n134 p28-40 (1973)
1973 ; 36refs
Includes discussion by T. W. Forbes and R. A. Olsen.
Availability: See serial citation

HS-013 977

VEHICULAR LIGHTING SYSTEMS FOR TWO-LANE RURAL HIGHWAYS

The article is a state-of-the-art survey of vehicle lighting, and shows the development of lighting both in Europe and the U.S. Possible new developments, such as a three-beam lamp, polarized systems, or gated elliptical systems, are reviewed in the context of increasing visibility on two-lane rural highways, while at the same time considering glare for oncoming motorists and pedestrians. Additional factors must be considered in overall design, such as vehicle load for large and small cars and the conditions of the roadways. Political considerations must be taken into account for regulatory control and standards.

by G. E. Meese
Highway Research Board Special Report n134 p41-50 (1973)
1973 ; 15refs
Includes discussion by P. Maurer and author's closure.
Availability: See serial citation

HS-013 978

STATE OF THE ART IN WARRANTS FOR FIXED ROADWAY LIGHTING

The article evaluates current guidelines and warrants, AASHO, Ketvirtis, and Commission Internationale de l'Eclairage, for fixed roadway lighting. The majority of warrants concern location of lights, and do not concern quantity or quality of lighting. They are primarily based on traffic volume, and some of the wording is ambiguous. There is a need for a more rational and realistic set of warrants based on driver informational needs as related to the roadway, traffic, and environmental conditions of the traffic facility. Such a set is being developed by the National Cooperative Highway Research Program, using a point grading system of evaluation.

by N. J. Rowan
Highway Research Board Special Report n134 p51-65 (1973)
1973 ; 3refs
Includes discussion by W. H. Edman, D. Fischer, J. S. Franklin, A. Ketvirtis, and R. E. Stark.
Availability: See serial citation

HS-013 979

TWO-WIRE EMERGENCY CALL SYSTEM

The results of the installation and usage tests of the 2-wire emergency call system do not indicate any significant advantages of that system over other types of call systems. Before-installation and after-installation field surveys were conducted to determine the number of motorists needing aid along the roadway and the type of problems they had. Details of servicing times for the stopped motorists also were collected. Records were maintained for system installation and maintenance costs. The summaries of the field survey and system costs are included. Costs for 2 other types of systems (telephone and call box) used in other states are included for comparison.

by E. F. Reilly; R. L. Hollinger; J. Santacroce
Highway Research Record n450 p1-12 (1973)
Rept. No. PB-220 676 ; 1973 ; 8refs
Availability: See serial citation

HS-013 980

A NEW APPROACH TO MOTORIST AID?

This paper suggests that a systems approach be used in implementing motorist aid systems and that a state agency be charged with statewide responsibility for motorist aid. The agency should develop plans for the implementation of motorist aid including means of detection, response, and service. The agency should have authority to develop new public resources or to contract with local service organizations for the operation of the system. The suggested procedure is that: a task force of advisors with expertise in the various aspects of motorist aid be organized; a sharper awareness among state officials regarding motorists' needs during breakdown be

developed; and technical resources and guidance during the design and implementation of an integrated statewide system be provided.

by S. Woolman; I. S. Wisepart
Highway Research Record n450 p13-18 (1973)
1973 ; 7refs
Availability: See serial citation

HS-013 981

SEARCHING FOR THE BEST LOCATIONS FOR SERVICE FACILITIES ALONG A FREEWAY

Two models were used to find the optimal locations for service facilities along a freeway. The first one is a simulation model called FREEQ. For a given accident or incident on the freeway, FREEQ can be employed to generate all necessary information, such as total travel time and individual average travel time on the freeway, provided that the demand pattern and the physical configuration of the freeway are known. Based on these results, an optimization model is used to search for the best locations for service facilities so that the total delay time caused by the accident or incident or the response time of the service unit is minimized. The Eastshore Freeway in the San Francisco Bay area was chosen to be the study area. Thus, a numerical problem is also given.

by W. -M. Chow; A. D. May
Highway Research Record n450 p19-35 (1973)
1973 ; 6refs
Includes discussions by R. L. Hess (Michigan Univ.), E. C. Carter (Maryland Univ.), J. A. Wattleworth (Florida Univ.), and author's closure.
Availability: See serial citation

HS-013 982

APPLICATION OF A SIMULATION MODEL TO TEST ALTERNATIVE RURAL EMERGENCY MEDICAL CARE TRANSPORTATION SYSTEMS

To improve the transportation facilities provided to rural areas, a stochastic simulation model to test alternative systems for providing emergency care was developed. These alternatives examined the impact of changing the number and location of ground ambulances within a rural area, introducing new technology (helicopters) to the medical care system, and utilizing the helicopter for supplemental functions to help off-set the costs of the system. It was found that fewer ambulances, supplemented by a helicopter, and relocated, could provide at least the same level of service within the study area.

by D. L. Gochenour, Jr.; E. S. Neumann; F. J. Wegmann
Highway Research Record n450 p36-45 (1973)
1973 ; 10refs
Availability: See serial citation

HS-013 983

1971 ANALYSIS OF ACCIDENT REPORTS INVOLVING FIRE, MARCH 1973

A special study contains data extracted from 732 accident reports which indicated that fire was involved in accidents of motor carriers of property and passengers during 1971. In part 1, the data base for property carriers consists of 51,158 reported accidents of which 711, or 1.29%, involved fire resulting in 140 fatalities, 311 injuries, and nearly nine million dollars in property damage. In part 2, the data base for passenger carriers consists of 2,588 accidents reported of which 21, or 0.81%, involved fire which caused two fatalities, 45 injuries, and nearly $400,000 in property damage. Statistical tables contain such data as the months of occurrence, types of units and accidents, locations and causes of the fires, mechanical defects of vehicles, the types of fuel tanks, and related information.

by Anonymous
Bureau of Motor Carrier Safety, Washington, D.C.
1973 ; 21p
Availability: Corporate author

HS-013 984

HIGHWAY ACCIDENT REPORT: MULTIPLE-VEHICLE COLLISION FOLLOWED BY PROPYLENE CARGO-TANK EXPLOSION, NEW JERSEY TURNPIKE, EXIT 8. SEPTEMBER 21, 1972

The report covers a series of collisions on the New Jersey Turnpike in September 1972. A southbound Greyhound bus was sideswiped by an overtaking tractor-semitrailer carrying propylene. The tractor-semitrailer then overrode the median guardrail, jackknifed, and overturned in the northbound lanes. Two persons in an automobile which collided with the overturned cargo-tank semitrailer were killed. About 25 minutes after the collisions, the cargo tank exploded; twenty-eight persons were injured in the explosion. It is determined that the probable cause of initial collision was the evasive steering and skidding of the bus into the path of the over-taking tractor-semitrailer. Override of the median guardrail by and subsequent overturn of the tractor and the semitrailer were caused by the inability of the guardrail to resist the forces generated by the tractor-semitrailer. Cause of the initial and secondary fires, as well as cause of the explosion, are also determined.

by Anonymous
National Transp. Safety Board, Washington, D. C.
Rept. No. NTSB-HAR-73-4; PB-225 032, SS-H-25 ; 1973 ; 40p
Contains Highway Safety Recommendations H-73-37 through H-73-40.
Availability: NTIS

HS-013 985

MOTOR CARRIER ACCIDENT INVESTIGATION: COLUMBIA AGRICULTURAL CO-OP, INC. ACCIDENT, MAY 11, 1973, OAKRIDGE, OREGON. RUN-AWAY TRUCK.

About 6:30 p.m. a cargo laden tractor semitrailer traveling at high speed on a 6% downgrade failed to negotiate a sharp curve, ran off the roadway, struck an ambankment, overturned onto the highway, and after sliding 250 feet came to rest blocking both traffic lanes. The tractor cab, torn from the chassis and hurled 60 feet forward, landed upright with the driver pinned inside. He died before he could be extricated. Cause of the accident was determined as the driver's failure to downshift properly on a long steep grade. He was familiar with the area but ignored the posted warning signs. The driver had a long history of traffic violations and was under suspension on the day of the accident. Examination of the trailer

after the accident showed that the brakes on the forward tandem axle wheels were inoperative. The truck was owned and operated by the driver. The cargo was bottled wine.

by Anonymous
Bureau of Motor Carrier Safety, Washington, D. C.
Rept. No. 73-3 ; 1973 ; 13p
Availability: Corporate author

HS-013 986

THE EFFECT ON RESPONSE RATES TO SAFETY RECALL CAMPAIGNS BY UTILIZING CURRENT NAME AND ADDRESS RECORDS

The State Farm Mutual Automobile Insurance Company and Ford Motor Company have completed a cooperative experimental evaluation of car owner response to auto recall campaigns. The purpose was to determine if an updated list of names and addresses based on current insurance company records would allow additional car owners, especially second owners, to be contacted and to determine whether an increase in the final repair rate would be attained. Letters were sent from both companies to selected groups of original and second owners. Letters were effective in increasing the response rate, the response for second owners being significantly higher than for first owners.

by R. C. Flakne; R. E. Gardner; W. W. Sorenson; T. O'Connell
Ford Motor Co., Dearborn, Mich.; State Farm Mutual Automobile Insurance Co., Bloomington, Ill.
1973 ; 18p
Availability: Corporate author

HS-013 987

A PRELIMINARY INVESTIGATION INTO LORRY TYRE NOISE

Recent research has indicated the possibility that with reduced power unit noise, tire to road surface noise could become the predominant source of truck noise. An investigation has shown that, although tire noise does not contribute and is unlikely to contribute significantly to levels measured in the British standard drive-by-test, tire road surface noise will be the predominant source of noise from envisaged quieter heavy trucks when they are traveling at speeds approaching 100 km/h on dry roads and at speeds over 50 km/h on wet roads. The parameters that most markedly affect tire noise are vehicle speed, tire tread pattern, road surface texture and whether the surface is wet or dry.

by M. C. P. Underwood
Transport and Road Res. Lab., Crowthorne, Berks. (England)
Rept. No. TRRL-LR-601; PB-226 060 ; 1973 ; 52p 12refs
Availability: Corporate author

HS-013 988

EFFECTS OF INTERVIEWER STYLE AND QUESTION FORM ON THE VALIDITY OF REPORTING AUTOMOBILE ACCIDENT INFORMATION

Respondents being interviewed may give inaccurate or biased information. One factor appears to be the interpersonal behavior of the interviewer vs. the respondent. When questions are long and redundant, the results apparently are better than if the reverse. Positive reinforcement of the respondent seems also to improve the findings. These two variables were used in a 2x2 factorial study, in one Michigan county, of all drivers involved during 1968-1970 in an accident, whose records were on file, and who still lived in the county. 310 drivers, 57% of the potential population, were selected. Eight white female interviewers without previous interviewing experience made the study following a month of training. Officially called a study of health and accidents, the data were actually meant to evaluate the effects of standard vs. redundant questions. The findings indicate that under certain conditions a professional style interview is superior to an inter-personal type. Indications are made for further study.

by R. Henson; C. Cannell; S. Lawson
HIT Lab Reports v3 nl2 p1-11 (Aug 1973)
1973 ; 10 refs
Availability: See serial citation

HS-013 989

THE ALCOHOLIC DRIVER

An overview of the drinking driver and his treatment is presented. Revocation and suspension of the driver's license are the most common treatments. Since drinking and driving offenses are punishable as crimes, jury trials are a possibility. To avoid a jury trial a plea is usually bargained and a plea of guilty to a minor traffic offense entered and the right to drive retained. Rehabilitation is discussed and the prognosis good. A difference is identified between the problem and social drinker with education and punishment recommended for the social drinker and rehabilitation and education for the problem drinker. Constructive coercion, an alcoholic rehabilitation effort, utilizing group therapy and/or individual counseling working toward a reintegration of the individual into the community could be useful in industrial, penal and correctional institutions, and in courts and hospitals. Merely revoking licenses seems to be ineffectual.

by M. G. Blinder; G. O. Kornblum
Case and Comment v77 n6 p3-5, 8-11 (Nov-Dec 1972)
1972 ; 21refs
Availability: See serial citation

HS-013 990

THE HONDA COMPOUND VORTEX CONTROLLED COMBUSTION SYSTEM. TEST REPORT AND EXECUTIVE SUMMARY

All three Honda CVCC vehicles submitted to EPA and tested repeatedly met the emission levels required for 1975. The lowest emitter of the three had completed the 50,000-mile AMA durability run without incident. There does not appear to be a significant fuel economy or driveability penalty associated with the engine. There is apparently adequate cushion in the emission levels at the 2000-pound test weight to also meet the 1975 levels with a 50% heavier vehicle. There is no particulate emission or smoke problem associated with the CVCC engine. There is no aldehyde emission problem associated with the CVCC engine. Additional NOx control will be required to reach the 1976 levels but the vehicles tested did not employ devices or special calibration for Nox control. The CVCC engine achieved lower emission levels than any other gasoline fueled engine without after-treatment ever tested by EPA.

by T. C. Austin
Environmental Protection Agency, Washington, D. C.
1973 ; 13p refs
Availability: Corporate author

HS-013 991

ROADLIGHTING AND ACCIDENTS: BEFORE AND AFTER STUDIES ON TRUNK ROAD SITES

A retrospective study of accidents in the dark is reported before and after installing new or improved lighting at 43 sites on trunk roads in various parts of England. The new installations came into operation between 1966 and 1970. Particular attention was paid to the effects associated with different speed limits. Changes in darkness accidents for the trial lengths were compared to the number of accidents occurring in darkness on the remainder of the trunk and class 1 roads having the same speed limit and within the same police district. Statistically significant changes in accidents were established only on the group of 19 roads with a 70 mile per hour speed limit. Other changes were about 15% reduction for 30 mph (10 sites) and 40 mph (7 sites) roads; an apparent increase in fatalities and injuries on the 50 mph roads (7 sites) may have been due to chance. The saving in accident costs on the 70 mph roads was about three times the annual cost of the lighting.

by B. E. Sabey; H. D. Johnson
Transport and Road Res. Lab., Crowthorne, Berks. (England)
Rept. No. TRRL-LR-586; PB-226 030 ; 1973 ; 18p 4refs
Availability: Corporate author

HS-013 992

BENEFIT-COST ANALYSIS OF A SPEED SIGNAL FUNNEL

The speed signal funnel is a traffic pacing system to control intersection traffic. Since no serious investigation of its economic feasibility has been performed in the U. S., the study sought to establish an index, in benefit cost ratio form, to compare the funnel with other highway measures. A high speed intersection under traffic actuated control was selected; data on traffic volumes, delays, approach speed profiles, and accident experience were gathered. A speed signal funnel with three variable message signals was then designed for each of the two major approaches to the intersection. Cost estimated for equipment, maintenance, vehicle operation, time, and accidents were developed. Benefit-cost ratios from 1.5-to-1 to 12-to-1 were obtained, depending on the assumptions underlying the computation.

by C. E. Dare; P. A. Jomini
Highway Research Record n445 p1-11 (1973)
1973 ; 12refs
Publication sponsored by Committee on Traffic Control Devices.
Availability: See serial citation

HS-013 993

FATAL AND INJURY ACCIDENT RATES ON FEDERAL-AID AND OTHER HIGHWAY SYSTEMS/1971

Fatal and personal injury accidents on U. S. highway systems during 1971, compiled from reports submitted by the 50 states and the District of Columbia, are given in 36 statistical tables. Trends are indicated in the first table containing data for the years 1967 through 1971, classified under the headings of rural, urban, total, non-interstate, interstate, primary and secondary routes, local roads, and streets. The following categories are shown: Fatality and fatal accident rates by highway system and state; Injury and injury accident rates by highway system and state; Fatality and injury accident data related to vehicle registrations, population, and licensed drivers; Fatalities, fatal accidents, and travel; Injuries, injury accidents, and travel.

by Anonymous
Federal Hwy. Administration, Washington, D.C.
Rept. No. PB-218 136 ; 1973 ; 41p
Availability: GPO $0.65 as TD2.20:971

HS-013 994

INTERSOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE (8TH) PROCEEDINGS, UNIVERSITY OF PENNSYLVANIA, PHILADELPHIA, AUGUST 13-17, 1973

Volume includes papers covering sessions on energy conversion for transportation systems, energy systems for residential, commercial and industrial power, biomedical power, aerospace power, and urban energy systems.

by Anonymous
American Inst. of Aeronautics and Astronautics, New York
1973 ; 854p refs
Includes HS-013 995 through HS-014 010; includes abstracts of papers from 1970 conference and subject and author index for papers from conferences for 1966-73.
Availability: Corporate source

HS-013 995

THE WET BRAYTON CYCLE ENGINE

The results of a study for a 150hp automotive gas turbine utilizing a recuperative-condensing system to extract water from the exhaust and inject it into the compressor on a continuous basis are presented. The analysis of the work shows wet compression will improve the thermal efficiency of the gas turbine and maintain this improvement over a wide range of pressure ratios. Current developmental work in compact heat exchangers promises to reduce heat exchanger volume considerably.

by B. E. Moore; D. G. Harden; W. J. Ewbank
Oklahoma Univ., Norman
HS-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p121-5
Rept. No. SAE-739044 ; 1973 ; 10refs
Availability: In HS-013 994

HS-013 996

THE WANKEL ROTARY ENGINE AS A STEAM EXPANDER

This paper describes the Wankel rotary engine in a positive displacement expander application. Of primary concern is the valving, porting and ducting needed to reproduce a typical pressure-volume diagram of a 600 psia, 10000 F steam cycle. A

new rotary valve design that assures the starting of the engine is being fabricated. Also, a digital computer simulation with steam as the working fluid is used to assess design concepts. This program includes real fluid mechanic models of the charging and emptying processes and realistic heat transfer models based on local surface-to-volume relationships.

by D. A. Bowlus; G. A. Brown; G. J. Silvestri
Naval Underwater Systems Center, Newport, R. I.
HS-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p131-7
Rept. No. SAE-739046 ; 1973 ; 9refs
Availability: HS-013 994

HS-013 997

SMALL RANKINE CYCLE TOTAL ENERGY SYSTEM FOR RECREATIONAL VEHICLES. A COMPARISON OF THREE POSSIBLE APPROACHES

Analysis of a Rankine Cycle (R/C) powered total energy system for motor homes and recreational vehicles shows that such a unit is superior to comparably priced conventional systems in weight, size, and fuel consumption. A unitized system which provides one ton of air conditioning, 20,000 BTU/hr of heating, and 500 watts of 110 v 60 cycle power is estimated to weigh approximately 170 lbs. and can be packaged in a 10''x48''x60'' shell. When providing full air conditioning and 500 watts of power, the fuel consumption is calculated to be approximately 3 lb/hr. If more than 500 watts of electrical power is required during the heating mode, 20,000 BTU/hr of heat can be supplied at no increase in fuel consumption over that needed for the electrical generation. Typical conventional recreation vehicles presently use a larger, heavier system which consumes about 3.6 lb/hr of fuel in the cooling plus 500 watts operating mode, and sells for about the same price as the R/C total energy package. In the heating mode, the R/C system utilizes rejected heat from the Rankine cycle-powered electrical system. This feature can result in a significant fuel saving over the conventional system.

by R. E. Barber
Barber-Nichols Engineering Co., Denver, Colo.
HS-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p138-45
Rept. No. SAE-739047 ; 1973 ; 2refs
Availability: In HS-013 994

HS-013 998

WORKING FLUID SELECTION FOR A SMALL RANKINE CYCLE TOTAL ENERGY SYSTEM FOR RECREATION VEHICLES

Fifteen potential Rankine Cycle working fluids were analyzed for use in a total energy system providing air conditioning, electrical power, and heating for travel trailers and recreational vehicles. Based on cycle efficiency, heat exchanger size and cost, fuel consumption, and parasitic power requirements, five superior fluids were selected. From these five, two were then chosen on the basis of flammability, toxicity, and thermal stability. The chosen fluids were monochlorobenzene and monobromobenzene. Both were then tested to evaluate thermal limits and material compatibility. For each fluid a number of additives were tested in efforts to miniminze thermal decomposition.

by D. K. Werner; R. E. Barber
Barber-Nichols Engineering Co., Denver, Colo.
HS-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p146-51
Rept. No. SAE-739049 ;

Availability: In HS-013 994

HS-013 999

LABORATORY TEST RESULTS. LOW EMISSION RANKINE-CYCLE ENGINE WITH ORGANIC-BASED WORKING FLUID AND RECIPROCATING EXPANDER FOR AUTOMOBILES

The paper presents a description of a low-emission Rankine cycle propulsion system for automobiles. The system uses an organic-based working fluid, Fluorinol-85, and a reciprocating expander. The system has been designed to fit into the production Ford Galaxie with modifications required only to the engine compartment and to the grill-bumper for installation of the Rankine-cycle engine. Results of testing show that the engine can be competitive in performance and fuel economy to the 1972 internal combustion engine and can be completely packaged in the engine compartment of the 1972 Ford Galaxie. Measured emissions from system tests confirm the potential of the engine for emission levels substantially lower than the 1976 Federal Standards.

by D. Morgan; P. Patel; E. Doyle; R. Raymond; R. Sakhuja; K. Barber
Thermo Electron Corp., Waltham, Mass.; Environmental Protection Agency, Washington, D.C.
HS-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p158-64
Rept. No. SAE-739062 ; 1973 ;
Availability: In HS-013 994

HS-014 000

STIRLING ENGINE WITH UNCONVENTIONAL HEATING SYSTEM

A stirling engine with a high temperature sodium heat-pipe has been tested for performance in a limited power range. The results obtained show an appreciable increase in specific power and provide valuable information for the engineers working with products having the shape and performance capabilities consistent with the needs of high-temperature stirling engines.

by T. A. Lia; R. S. G. Lagerqvist
United Stirling (Sweden) A. B. and Co., Malmo
HS-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p165-73
Rept. No. SAE-739073 ; 1973 ; 6refs
Availability: In HS-013 994

HS-014 001

THE HYDROGEN-AIR FUELED AUTOMOBILE ENGINE (PT. 1)

This paper describes the progress made on the development of the hydrogen-air fueled automobile engine described at last year's Intersociety Energy Conversion Engineering Conference. Since that time a 4 cylinder, 195 cu in Pontiac engine

has been redesigned, incorporating an improved version of the hydrogen induction technique, to run on hydrogen and vaporized gasoline. Performance curves and emission data for the engine fueled by hydrogen are given.

by R. R. Adt, Jr.; D. L. Hershberger; T. Kartage; M. R. Swain
Miami Univ., Coral Gables, Fla.
HS-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p-194-7
Rept. No. SAE-739092 ; 1973 ; 3refs
Availability: In HS-013 994

HS-014 002

LOW POLLUTION AUTOMOBILE ENGINE

A new internal combustion engine concept is proposed that promises to reduce air pollution significantly. The engine is designed to burn very high air/fuel ratios and thus burn at lower maximum temperature. The basic idea is to use two cylinders for a complete round of four cycles. In a conventional engine, all cycles (intake, compression, expansion, and exhaust) take place in the same cylinder. In the proposed engine the air/fuel mixture is drawn in and compressed in a cooled cylinder. Then the mixture is transferred to a larger, hot, insulated cylinder where the air/fuel mixture comes in contact with many red hot surfaces and high temperature compressed exhaust gases and thus is readily ignited and burned at constant volume. The hot gas is expanded fully on the power stroke and then pushed out as exhaust.

by G. DeVries
HS-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p208-13
Rept. No. SAE-739095 ; 1973 ; 8refs
Availability: In HS-013 994

HS-014 003

NEW BOILER CONCEPTS FOR ADVANCED AUTOMOTIVE RANKINE CYCLE POWER PLANTS

The closed Rankine Cycle heat engine utilizing an external combustion system has been identified as a potential low emission alternative to the spark ignition reciprocating internal combustion engine. A particular problem associated with the development of the Rankine cycle heat engine is the relatively large size of the boiler component. Engine boilers presently under development are of one family; the mono- or multi-tube type which have a spiral or parallel tube design orientation. This paper discusses alternative heat transfer technology which appears to have design advantages and also may result in smaller physical boiler configurations. Nonconventional modes of heat transfer which use large acceleration fields, sprays, and rotational motion may be used to improve boiler performance. The literature indicates that significantly larger heat transfer coefficients and higher critical heat fluxes exist for such nonconventional boiler technology. Application of this technology may result in a size reduction and improved boiler stability over the currently employed designs.

by F. W. Paul; N. A. Macken
Carnegie-Mellon Univ., Pittsburg, Pa.
Grant EPA-R-802466
HS-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p214-20
Rept. No. SAE-739097 ; 1973 ; 31refs
Availability: In HS-013 994

HS-014 004

PASSENGER CAR DESIGN INFLUENCE ON FUEL CONSUMPTION AND EMISSIONS

Results of a study of the effects of vehicle design parameters on emissions and fuel consumption are given for cars following prescribed driving cycles. A digital computer simulation of a vehicle was used to predict fuel consumption and exhaust emissions for a given power plant. Vehicle design parameters which were considered are vehicle size and weight, power plant and drive line factors. Exhaust emissions were calculated for a vehicle following the Federal Driving Cycle. Improvements can be obtained in vehicle exhaust emissions without excessive fuel consumption penalties. Vehicle size and weight control can produce a 25% improvement in fuel consumption while at the same time lowering exhaust emissions. Other parameters also achieve significant gains.

by L. L. Ambs
Massachusetts Univ., Amherst
HS-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p227-31
Rept. No. SAE-739113 ; 1973 ; 8refs
Availability: In HS-013 994

HS-014 005

EMISSIONS FROM HYBRID VEHICLES

The emissions reduction potential of piston engine-electric hybrid vehicles was studied. Series and parallel hybrids were considered in a 4000 lb. vehicle. To facilitate this study, a computer program was written which modeled the vehicle and, using engine test data, computed its emissions and fuel consumption over the 1972 FTP driving cycle, starting with a fully warmed-up engine. It was found that under certain conditions emissions may be reduced for a hybrid vehicle as compared to its conventional counterpart, but under other conditions, they may be increased. The extent of the reduction or increase experienced with hybrid operation depends on the particular pollutant and the engine operating conditions. Unburned hydrocarbons, for example, are reduced by as much as 76%. Depending on conditions, carbon monoxide and oxides of nitrogen are shown both to increase by up to 23% and to decrease by up to 40%. Therefore, the hybrid vehicle does not automatically guarantee lower emissions.

by S. G. Liddle
General Motors Res. Labs., Warren, Mich.
HS-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p235-42
Rept. No. SAE-739115 ; 1973 ; 9refs
Availability: In HS-013 994

HS-014 006

HYBRID ELECTRIC PROPULSION UTILIZING RECONNECTIBLE MOTOR WINDINGS IN WHEELS

The paper describes hybrid electric propulsion concepts for d.c. and a.c. motor drives, including the a.c. electric motor reconnection wheel in terms of its functional utility. The concept appears to be well suited to the multiple disposition of power from a centrally located electrical power source. Potentially, this can lead to an overall lower vehicle profile and a revised chassis structure without mechanical transmissions and other obstructions. Incorporation of modular sub-system construction techniques can be utilized to contribute to a higher mean time between failures and to attain an improved equipment serviceability by semi-skilled personnel in the field.

by E. Reimers
Army Mobility Equipment Res. and Devel. Center, Fort Belvoir, Va.
HS-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p243-50
Rept. No. SAE-739116 ; 1973 ; 9refs
Availability: In HS-013 994

HS-014 007

LARGE SIGNAL DYNAMIC ANALYSIS OF MONOTUBE VAPOR GENERATORS

A large signal dynamic model of a monotube vapor generator, developed for the quantitative evaluation of control systems for Rankine cycle automotive power plants, is described. The model is defined in terms of physical variables and can be used to represent either water or organic fluid operation. Particular attention was paid to simulate the dynamic effect of thermal wave propagation. The vapor generator model is separated into three sections on the basis of fluid properties. In each of the sections a simplified equation of state is used to describe the properties of liquid, boiling fluid and superheated vapor. In each section independent calculation of combustion gas to boiler metal heat transfers are made. Similarly, the metal to fluid heat transfer is independently calculated in each section. Typical static and dynamic results using both water and an organic fluid as the working fluid are given. Comparison of computer results with static and dynamic experimental data available in the water system proves the validity of the model.

by E. A. Mayer
Bendix Res. Labs., Southfield, Mich.
HA-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p251-65
Rept. No. SAE-739117 ; 1973 ; 4refs
Availability: In HS-013 994

HS-014 008

THE LOW EMISSION CAR FOR 1975--ENTER THE DIESEL

Two series of tests, conducted by SwRI and EPA, have demonstrated the ease with which an unintentionally controlled diesel-powered car can meet the CO, HC and NOx standards. The automobiles involved were not modified or otherwise prepared for the tests. Other tests using heavy duty diesel test procedures confirmed the relatively low emission levels reported on the light duty procedure. Fuel economy has been shown to be substantially better, on the order of 70%, with the diesel-powered car than from average gasoline-powered cars. The Mercedes diesel-powered car is as quiet and vibrationless as the gasoline version.

by K. J. Springer; H. A. Ashby
Southwest Res. Inst., San Antonio, Tex.; Environmental Protection Agency, Washington, D.C.
Contract CPA-70-44
HS-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p266-85
Rept. No. SAE-739133 ; 1973 ; 18refs
Availability: In HS-013 994

HS-014 009

PERFORMANCE POTENTIAL OF SINGLE-STAGE GAS TURBINE ENGINES

Gas turbine engines having only single-stage compressors and turbines today have the potential of efficient operation at pressure ratios up to 12:1 and turbine inlet temperatures of 21000 F. BSFC equalling 0.45 lbs per hp-hr. is within possible development limits for non-regenerated engines of this class. Torque characteristics similar to diesel engines can be provided by differential turbines retaining basic flow path simplicity. Previously-unpublished development status of an experimental engine is described.

by H. J. Wood
Wood (H. J.) and Associates, Sherman Oaks, Calif.
HS-013 994, 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p286-97
Rept. No. SAE-739135 ; 1973 ; 14refs
Availability: In HS-013 994

HS-014 010

400 HP CLOSED GAS TURBINE BUS ENGINE

This paper describes a low pollution, highly efficient 400 hp closed gas turbine engine designed to propel an urban bus that will be capable of accelerating to expressway speeds in a minimum distance. Closed cycle engines are inherently quiet and are low in chemical pollution due to continuous combustion with external heat addition. This closed gas turbine engine is very efficient due to being highly recuperated which results in a low fuel consumption directly competitive with

diesel engines. The part load specific fuel consumption is less than at full load. The engine specific weight is less than 3.0 lb-hp.

by A. Pietsch; R. A. Rackley
AiResearch Mfg. Co. of Arizona, Phoenix
HS-013 994, Intersociety Energy Conversion Engineering Conference (8th) Proceedings, New York, 1973 p298-303
Rept. No. SAE-739155 ; 1973 ; 1ref
Availability: In HS-013 994

HS-014 011

PRECISION TREADWEAR MEASUREMENTS AT INCREASED MILEAGES BY AN IMPROVED RADIOIODINE METHOD

Radioisotope techniques have been applicable to measuring abrasion losses in tires for some time but have not received wide use. A tire is tagged with a toluene solution of Iodine-125 to a depth of about 25 mils and its radioactivity level is measured at the site of penetration. Periodic measurement of decreasing radioactivity as road tests proceed gives the amount of abrasion. The objective of investigation was to use several test tires with various treadstock types to prove that road abrasion test results would agree with laboratory calibration curves. Tire samples covered a full range for passenger cars, heavy duty trucks, off road vehicles, and airplanes. Results are reported as satisfactory.

by A. C. Patel; M. L. Deviney
Rubber Chemistry and Technology v46 n4 p787-800 (Sep 1973)
1973 ; 6refs
Presented at a meeting of the Rubber Division, American Chemical Society, Detroit, Mich., May 1-4, 1973.
Availability: See serial citation

HS-014 012

ACCELERATED TIRE WEAR UNDER CONTROLLED CONDITIONS. 1. DESCRIPTION OF THE TEST SYSTEM

Tire wear is produced by a series of complex physical and chemical reactions occurring at the rubber-pavement interface. A sophisticated test system consisting of an instrumented two wheel trailer, a towing vehicle with appropriate control and recording instrumentation, and various supplementary measurement devices is used to study this phenomenon. For a realistic conclusion, both external and internal factors pertinent to the tire wear have been tested to show that the linear wear curves are obtained, that the effects of tire load and speed in trailer testing are of minor importance, and that sectional and whole tire wear rates are equal.

by A. G. Veith
Rubber Chemistry and Technology v46 n4 p801-20 (Sep 1973)
1973 ; 11refs
Presented at a meeting of the Rubber Division, American Chemical Society, Detroit, Mich., May 1-4, 1973; See also HS-014 013.
Availability: See serial citation

HS-014 013

ACCELERATED TIRE WEAR UNDER CONTROLLED CONDITION. 2. SOME FACTORS THAT INFLUENCE TIRE WEAR

Using an instrumented two wheeled trailer and a towing vehicle, a determination of important factors in tire wear has been made. Three primary factors are found to be tire force, pavement texture, and tire surface temperature, the major one being sustained or instantaneous tire force. Accelerometer measurements show that cornering or lateral forces are chiefly responsbile for wear in contrast to longitudinal driving or braking forces. The wear rate depends exponentially on tire cornering force. Pavement texture involves harsh aggregate pavements which produce a faster rate of wear than smoother blunt aggregate pavements. Tire surface temperature influences absolute wear rate and compound relative rating. All three factors must be considered in correlation calculations for an accurate approach to tire wear import.

by A. G. Veith
Rubber Chemistry and Technology v46 n4 p821-42 (Sep 1973)
1973 ; 26refs
Presented at a meeting of the Rubber Division, American Chemical Society, Detroit, Mich., May 1-4, 1973. See also HS-014 012.
Availability: See serial citation

HS-014 014

URETHANE ENERGY ABSORBERS FOR AUTOMOBILE BUMPERS

Factors considered in evaluating energy-absorbing systems for automobile design demonstrate the fitness of urethane foam for absorbing energy in automobile bumpers. Impact tests at severe overloads have shown the recoverability of foam with minimal damage to the object impacted. Moldability of the foam provides ample styling freedom. Temperature compensation features assure designable performance consistency, yet costs and maintenance are low. The author suggests that an amendment might be made to Motor Vehicle Safety Standard 215, "Exterior Protection-Passenger Cars", allowing the use of urethane foam in a representative test in bumper construction.

by P. A. Weller
Rubber Chemistry and Technology v46 n4 p843-61 (Sep 1973)
1973 ; 2refs
Presented at a meeting of the Rubber Division, American Chemical Society, Detroit, Mich., May 1-4, 1973.
Availability: See serial citation

HS-014 015

AN ELASTOMERIC IMPACT-ABSORBING BUMPER SYSTEM

1974 automotive bumpers must withstand 5 mph front and rear fixed barrier impacts without damage to operating systems. The kinetic energy involved exceeds what 1973 bumpers can dissipate, so a better impact absorber is required. It must operate from -20 to 150 deg. F, permit bumper jacking, sustain lateral and vertical loading, and be reliable. An elastomeric bumper is described, utilizing the shear deformation of rectangular rubber blocks adhesively bonded between a slidable steel I-beam and a surrounding steel case. On impact the I-beam ram is forced back between the rubber blocks, creating a shear deformation to each block. After impact is over the system recovers. A discussion is made of optimum design, stresses and strains, and life expectancy. Mechanical requirements are outlined. Potential materials are noted, including natural and butyl rubbers, ethylene-propylene terpolymer, and styrene-butadiene rubber. The system will withstand high angular impact as well.

by K. C. Rusch; J. M. Slessor
Rubber Chemistry and Technology v46 n4 p862-76 (Sep 1973)
1973 ; 5refs
Presented at a meeting of the Rubber Division, American Chemical Society, Detroit, Mich., May 1-4, 1973.
Availability: See serial citation

AN ASSESSMENT OF DIESEL ENGINE POPPET VALVES

Factors are reviewed regarding the reliability and durability of poppet valves of highly rated medium speed diesels burning standard or residual oils, with particular reference to the latter. From detailed analysis, the undercut or tuliped profile appears preferable. Valve behavior under operating conditions suggests a passive part in the phenomenon of valve sinkage. Adoption of differentially angled seats seems to have little meaning in practice. Cylinder head deflection was observed to be a governing feature in seat guttering. A review of material properties indicates inadequacy of the often quoted Eichelberg quality factor; an alternative parameter for assessing materials suitability is derived. Poor resistance to corrosion characterizes all present materials. A number of possible palliatives are examined.

by R. Bertodo; S. Sivakumaran
Perkins Engines Ltd., Peterborough, Northouts, (England);
Ruston Paxman Diesels Ltd., Newton-le-Willows, Lancs. (England)
Institution of Mechanical Engineers Proceedings v187 n2 p31-41 (1973)
1973 ; 21refs
Prepared for presentation at an ordinary meeting of the Institution of Mechanical Engineers, London, 17 Jan 1973.
Availability: See serial citation

HS-014 017

SOME FACTORS INFLUENCING CYLINDER HEAD GASKET PROBLEMS AND DESIGN

The environment under which a cylinder-head gasket has to function is reviewed and a typical cylinder head to cylinder block assembly is considered, outlining the temperature variations in the inlet and exhaust ports. Curves showing head-face to block-face movement for varying engine speeds and coolant temperatures are reviewed with power units running at accelerated gasket destruction test conditions. Comparisons are made between cast-iron block and aluminum head and cast-iron head and block for both gasoline and diesel engines. It is noted that prediction of gasket design for one engine in relation to gasket sealing will not necessarily apply to another power unit.

by M. G. Herrington
Coopers Mechanical Joints Ltd., Slough, Bucks. (England)
Institution of Mechanical Engineers Proceedings v187 n3 p43-9 (1973)
1973 ;
Prepared for presentation at an ordinary meeting of the Institution of Mechanical Engineers, 13 Feb 1973.
Availability: See serial citation

HS-014 018

THE DIESEL ENGINE TO COMPETE WITH THE GAS TURBINE IN THE LARGE COMMERCIAL VEHICLE FIELD

Interest in gas turbines as power plants for future heavy commercial vehicles has promoted a general study of power plant requirements for this application over the next decade, including likely demand and power levels. With this likelihood as a guide, trends in the development of the diesel engine are examined, and predictions are made of speeds, mean brake effective pressures, and configurations which might result. Some areas of technical interest are discussed. It is concluded that the diesel will continue to meet operator requirements in the period considered, and will remain fully competitive with alternatives.

by D. Broome
Ricardo and Co. Engineers, Ltd., Dorchester, Dorset (England)
Institution of Mechanical Engineers Proceedings v187 n4 p17-29 (1973)
1973 ; 21refs
Prepared for presentation at an ordinary meeting of the Institution of Mechanical Engineers, 9 Jan 1973.
Availability: See serial citation

HS-014 019

A FINITE ELEMENT METHOD FOR THE CALCULATION OF LOCUS PATHS IN DYNAMICALLY LOADED BEARINGS

A method using finite elements for the solution of journal bearings is outlined. The special properties of an exponentially shaped element are used together with a satisfactory approximation for the axial pressure profile. This approach is one hundred times faster than a conventional finite difference solution of equivalent accuracy. The method can be applied to the solution of locus paths for journal bearings under external dynamic load or under whirl conditions. The predictor-corrector method used to march out a locus path is briefly outlined and several typical loci are presented as examples.

by P. D. Shelly; C. Ettles
British Iron and Steel Res. Assoc., London; Imperial Coll. of Science and Technology, London (England)
Institution of Mechanical Engineers Proceedings v187 n5 p79-86 (1973)
1973 ; 8refs
Availability: See serial citation

HS-014 020

QUADRATIC PERFORMANCE INDICES AND OPTIMUM SUSPENSION DESIGN

This paper presents some results obtained from the computer simulation of a two-dimensional linear vehicle model with coupled bounce and pitch modes. The effects of variations in the ratio of front to rear spring stiffnesses and the inertia coupling ratio on various performance indices for ride quality and road holding were investigated. Two forms of input to the system were considered, (a) isolated smooth bumps of varying length and (b) continuous random type excitations. Allowance was made for the time delay between the inputs at the front and rear wheels due to the forward speed of the vehicle.

by A. G. Thompson
Adelaide Univ., S. A. (Australia)
Institution of Mechanical Engineers Proceedings v187 n9 p129-39 (1973)
1973 ; 5refs
Availability: See serial citation

HS-014 021

SAFER BRAKING SYSTEMS

This paper examines some of the problems involved in engineering safer braking systems which will be appropriate for modern road vehicles and traffic conditions. Braking systems are becoming more complicated, mainly because of the influence of international regulations, but also to take account of technical improvements in performance, which can be achieved with advanced forms of control systems, including anti-locking brakes. The need to ensure maximum safety is emphasized; despite the increasing complexity and despite a shortage of accident know-how, increased road safety must always remain the ultimate objective.

by B. Ingram; P. Oppenheimer
Girling Ltd., Birmingham, Warwick (England)
Institution of Mechanical Engineers Proceedings v187 n10 p87-97 (1973)
1973 ; 3refs
Prepared for presentation at an ordinary meeting of the Institution of Mechanical Engineers, London, 13 Mar 1973.
Availability: See serial citation

HS-014 022

FULL POWER HYDRAULIC BRAKE ACTUATION SYSTEM FOR MOTOR VEHICLES

The vast majority of motor vehicles have had for some 30 years hydraulically actuated wheel brakes of the fixed displacement type. This paper describes the limitations of such a system and the justification for going to the more advanced full-power system that is at present offered on a limited number of vehicles. Once the decision to adopt a full-power system is taken, a considerable new potential is available to the vehicle designer. The basic philosophy and design parameters of a power system are described at length and detailed analysis is made of the several component unit designs.

by A. C. Firth; D. Parsons
Concentric Pumps Ltd., Birmingham (England); Lockheed Hydraulic Brake Co. Ltd., Leamington Spa, Warwick (England)
Institution of Mechanical Engineers Proceedings v187 n19 p141-8 (1973)
1973 ;
Availability: See serial citation

HS-014 023

BLOCK-PROGRAMME FATIGUE TESTING OF AUTOMOBILE WHEEL SPINDLES

Fatigue tests are reported on Ford Capri wheel spindle bodies. Three series were aimed at investigating the effect of load application sequence in a multilevel constant-frequency block program. A further study investigated the effect on fatigue life of removing the low-load cycles from the test sequence. Sequence of individual blocks apparently had no significant effect on fatigue life. Removal of stress levels equal to or less than 1.75 times the root mean square value of normal load frequency distribution had no effect on fatigue damage, leading to an 87 percent reduction in testing time. It was concluded that tests on small notched cantilever specimens led to very similar conclusions, so that such specimens may be used for proving and developing testing programs.

by J. D. Tedford; B. Crossland
Queen's Univ. of Belfast (Northern Ireland)
Institution of Mechanical Engineers Proceedings v 187 n24
p295-9 (1973)
1973 ; 13refs
Availability: See serial citation

HS-014 024

EFFECT OF CONTACT GEOMETRY AND ELASTIC DEFORMATIONS ON THE TORQUE CHARACTERISTICS OF A DRUM BRAKE

Existing torque analyses of drum brakes, based on the assumption that the shoe and drum are rigid, fail to predict torques accurately, especially when the lining makes non-uniform contact with the drum. An analysis has been made therefore of a floating shoe brake in which the elastic deflections of the shoe and the drum have been included. The analysis has been verified by measuring the torque developed by a standard two-leading shoe brake on an inertia dynamometer under different contact conditions. The agreement between the theoretical and observed torques was found to be better than plus or minus 10 percent even under extreme contact conditions and much better under more moderate conditions. Some consequences of the theory are discussed because of their practical importance.

by N. Millner; B. Parsons
Ferodo Ltd., Stockport, Cheshire (England); Leeds Univ., Yorks. (England)
Institution of Mechanical Engineers Proceedings v187 n26
p317-31 (1973)
1973 ; 7refs
Availability: See serial citation

HS-014 025

CLUTCH JUDDER IN AUTOMOBILE DRIVELINES

The class of torsional oscillations commonly described as clutch judder is shown to be caused by a cyclic variation of torque, a forced oscillation rather than a self generated one. The frequency synchronizes with the slip speed between the elements of the clutch. Generation is generally ascribed to misalignment, involving two concepts--out of truth and non-linearity in friction, operating separately or together. Following laboratory tests of a vehicle set up with a special clutch assembly prone to judder and investigated on various gradients, a realistic simulation was developed on an analog computer, demonstrating this behavior in a driveline system. Possible causes of judder are discussed.

by R. P. Jarvis; R. M. Oldershaw
Automotive Products Co. Ltd., Leamington Spa, Warwick (England)
Institution of Mechanical Engineers Proceedings v187 n27
p369-79 (1973)
1973 ; 4refs
Availability: See serial citation

HS-014 026

SOME AERODYNAMIC ASPECTS OF SAFETY IN ROAD VEHICLES

A continuing trend towards faster and lighter cars has led to an investigation of the lift created by vehicle design. Although conditions in which a car travelling on a smooth road might actually take off have not yet been approached, a reduction in wheel loadings of 5 percent has been observed at a speed as low as 62 miles per hour. Such a reduction affects car handling particularly if crosswind conditions produce added lift. To identify the factors determining aerodynamic lift of automobiles an extensive program of wind tunnel testing was conducted, using quarter scale models of bluff and streamlined forms. The influence is reported of basic parameters such as camber, incidence, thickness, ground clearance, and underbody roughness. An indication is given of the extent to which the lift is modified by the squaring of leading and trailing edges, the roundings of corners, and the effectiveness of lift reducing devices under the car nose.

by G. W. Carr; M. J. Rose; N. P. Smith
Motor Industry Res. Assoc., Nuneaton, Warwick (England)
Institution of Mechanical Engineers Proceedings v187 n30
p333-60 (1973)
1973 ; 29refs
Availability: See serial citation

HS-014 027

EFFECT OF PRE-INJECTION FUEL TEMPERATURE UPON DIESEL ENGINE IGNITION DELAY AND SOOT EMISSION

Ignition delay and soot formation in a diesel engine combustion chamber are influenced by the quantity, quality, and distribution of the mixture created from evaporation of the injected liquid fuel. The effect of pre-injection fuel temperature control to solve these two problems has been investigated on an i.d.i. engine running on diesel oil. The report reexamines the issue of fuel preheating, with reference to only the ignition delay and soot emission for an engine capable of running at the high speeds now employed. Effects of evaporation in the engine cycle at both subcritical and supercritical pressures are discussed, and attention is focused on the probable attainment of the critical temperature by liquid droplets in certain ambient conditions. Stress is laid on optimization of injection equipment and of the level of air swirl within the chamber.

by R. W. Temple-Pediani
Polytechnic of the South Bank, London (England)
Institution of Mechanical Engineers Proceedings v187 n32 p395-404 (1973)
1973 ; 19refs
Availability: See serial citation

HS-014 028

GASOLINE FOR LOW-EMISSION VEHICLES

The future fuel for passenger cars will be a blend of liquid hydrocarbons. Front-end volatiles will be limited by vapor-pressure control to minimize handling losses and to accommodate vapor recovery systems. The use of certain high boiling hydrocarbon constituents will be restricted to that degree required to provide optimum emissions control at lowest overall system cost. The use of lead alkyl anti-knocks, and other components which are deleterious to catalysts, will be disallowed. In some geographic areas, control of gasoline olefinicity can be expected until today's uncontrolled cars are lost by attrition from the total population of vehicles. Aromatics contents will, in general, not increase much beyond today's levels. The fuels which will evolve for the emission controlled reciprocating internal combustion engine will accommodate any near-future alternative powerplant for passenger cars. Finally, gaseous fuels will be used increasingly by passenger car fleets and trucks in urban areas but will not be widely distributed for general use by the average motorist.

by J. C. Ellis
Shell Oil Co., Houston, Tex.
Institution of Mechanical Engineers Proceedings v187 n34 p413-23 (1973)
1973 ; 26refs
Availability: See serial citation

HS-014 029

CLEARING THE AIR. FEDERAL POLICY ON AUTOMOTIVE EMISSIONS CONTROL

The report analyzes the political aspects of the National Emissions Standards Act of 1970 and how it affects the public, the automotive industry, and automotive technology prior to and subsequent to the Act. The passing of the Act represented a major victory for the public interest over a major industry, but whether the victory will result in cleaner air, or in enormous economic, social, and political costs to the consumer without objectives being met, is at present a questionable issue. Alternative decisions which could be used to solve the problems, including stronger federal controls, state controls, are analyzed.

by H. D. Jacoby; J. D. Steinbruner; M. C. Weinstein; I. D. Clark; J. M. Appleman; W. R. Ahern, Jr.
Harvard Univ., Cambridge, Mass.
Ballinger Publishing Co., Cambridge, Mass., 1973
Rept. No. ISBN-0-88410-301-3 ; 1973 ; 224p 66refs
Sponsored in part by National Science Foundation and Ford Foundation.
Availability: Publisher

HS-014 030

MODE OF TRANSPORTATION AND PERSONAL CHARACTERISTICS OF TRIPMAKERS

This report of the 1969-1970 Nationwide Personal Transportation Survey presents personal characteristics of all individuals 5 years old and over who reported making a one-way trip by a motorized vehicle. The survey data were expanded to represent travel habits on an annual basis for the entire U.S. population. The percentage distributions of these trips by mode are related to age, sex, race, and place of residence. Trips are aggregated to show personal travel for all purposes. The age-groupings have been selected to provide data for a variety of transportation planning needs: for example, to furnish information about school children (5-13), teenagers (14-20), young adults (21-25), persons normally included in the work force (21-59), and several usual break points for classifying older persons: 60-64, 65-69, and 70 and over.

by A. Randill; H. Greenhalgh; E. Samson
Federal Hwy. Administration, Washington, D.C.
Rept. No. 9 ; 1973 ; 50p
Rept. no. 9 of Nationwide Personal Transportation Study.
Availability: Corporate author

HS-014 031

CHARACTERISTICS OF DRIVERS INVOLVED IN SINGLE-CAR ACCIDENTS

This report describes a methodology for retrospective, in-depth, psychological investigation of driver fatalities. The results suggest that fatally injured drivers of single-car accidents can be differentiated from fatally injured drivers of multiple-car accidents on the basis of life-style and personality characteristics. Similarly, an overlap group of multiple-car and single-car drivers with a history of excessive alcohol usage may be differentiated from all other fatally injured drivers on the same basis. The Katz Adjustment scales significantly differentiated the above groups from a normative population on five of 18 scales. Preventive methods suggested by these results include educational efforts directed toward sensitizing persons in contact with high-risk drivers for the purposes of intervention, and the development of automatic safety equipment.

by C. W. Schmidt, Jr.; S. Perlin; W. Townes; R. S. Fisher; J. W. Shaffer
Contract FH-11-7399
Archives of General Psychiatry v27 n6 p800-3 (Dec 1972)
1972 ; 12refs
Prepared in cooperation with Maryland Medical-Legal Foundation, Inc.
Availability: See serial citation

HS-014 032

METHODS OF APPLICATION--FIELD OF VIEW TARGETS

Ideally the automobile driver would have an unobstructed view 3600 around him, but roof support and rear view system requirements make tradeoffs necessary. The paper describes a new tool--a program written for an interactive computer graphics system--which can be utilized for a total evaluation of driver visibility requirements in any given vehicle. XYZ coordinates of window openings, visual obstructions, mirror systems, and driver eye points are supplied as data. Polar coordinate line drawings are generated to display a simulation of what a driver would see directly and indirectly. The program can be used to evaluate driver visibility in terms of forward and rearward visibility target areas, including sides and rear view mirrors.

by D. Mauer; D. Fawcett
Ford Motor Co., Dearborn, Mich.
Rept. No. SAE-730610 ; 1973 ; 17p 2refs
Presented at Automobile Engineering Meeting, Detroit, Mich., 14-18 May 1973.
Availability: SAE

HS-014 033

FIELD OF VIEW FROM AUTOMOTIVE VEHICLES

The field of view required to see various classes of objects from automotive vehicles was investigated by Ford Motor Company in a series of research projects that included literature surveys, analytical studies, human factors tests and photographic road-traffic surveys. The study is concerned with field of view 3600 around the vehicle: forward field, side field, and rear field. Three-dimensional field of view volumes enclosing the locations of actual objects were constructed from the results of the Ford studies. Field of view targets, generated analytically from the volumes, may be used as simplified two-dimensional representations of the volumes. Composite field of view targets shown to scale are given for the forward field, the side field and the rear field of view. These are illustrated in terms of field of view angles to see the targets from a passenger car. Detailed presentations of the targets in rectilinear coordinates are given. These may be used to compute field of view angles for vehicles other than passenger cars.

by L. M. Forbes; E. Farber; T. F. Swigart; D. D. Jack
Society of Automotive Engineers, Inc., New York
Rept. No. SAE-SP-381 ; 1973 ; 145p 46refs
Presented at Automobile Engineering Meeting, Detroit, Mich., 14-18 May 1973, as SAE-730606 thru SAE-730609.
Availability: SAE

HS-014 034

TESTING AND EVALUATION AS APPLIED TO VEHICLE STRUCTURES AND EXTERIORS

The techniques used for testing and evaluation of surface vehicles have been significantly improved in recent years as a result of the emphasis placed on vehicular safety by the National Highway Traffic Safety Administration. The automotive industry and independent test laboratories have incorporated the latest test techniques available in order to assure that meaningful data are evolving from the millions of dollars currently being expended on improving the safety of the surface vehicles. This paper presents a summary of testing and evaluation techniques currently being used in the area of vehicle structures and exteriors research. Support functions such as facility design, data acquisition and data processing are discussed. The paper reflects the latest in the state-of-the-art of test techniques as presented in public documents and reviews the merits and limitations of certain techniques.

by R. L. Anderson; F. E. Arndt; R. A. Rockow
Dynamic Science, Phoenix, Ariz.
HS-820 306, Vehicle Safety Research Integration Symposium, Washington, 1973, p39-54
1973 ;
Availability: In HS-820 306

HS-014 035

PEDESTRIAN SAFETY RESEARCH

Automobile impacts with pedestrians continue to account for approximately 10,000 fatalities and 150,000 injuries on the nation's roadways annually. This remains an area of the total highway fatality and injury spectrum which is virtually unaddressed by present safety standards. A review of past pedestrian impact research consisting of statistical analyses of accident data, experimental impacts utilizing vehicles and pedestrian surrogates, and development of various analytical pedestrian simulators reveals the areas and direction needed for additional research in pedestrian impact protection area. The National Highway Traffic Safety Administration's pedestrian impact protection program is discussed and considered in relation to both the objectives of pedestrian injury mitigation and compatibility with the design considerations of the crashworthiness programs.

by R. H. Eppinger
National Hwy. Traf. Safety Administration, Washington, D.C.
HS-820 306, Vehicle Safety Research Integration Symposium, Washington, 1973, p247-55
1973 ; 10refs
Includes questions and answers.
Availability: In HS-820 306

HS-014 036

DEVELOPMENT OF BRAKE INSPECTION CRITERIA AND EQUIPMENT

Presented is a summary of past, current, and future research and development efforts directed to development of a passenger car-light truck brake inspection system for use in the implementation of state inspection programs. In initial efforts, literature searches and studies established the state-of-the-art of state inspection programs, standards, and inspection equipment and the current knowledge of brake system degradation. Modes of degradation investigated included worn friction materials (linings, pads, discs, and drums), and contaminated linings. Results indicate that some modes of degradation result in catastrophic failure and thus brake system inspection must include measurement of more than just performance. Current efforts are directed to the development of a cost-effective brake inspection system. The effort includes the evaluation of available equipment, development of inspection techniques, generation of inspection system specifications, and building and demonstrating the brake inspection system.

by M. H. Cardon
Bendix Res. Labs., Southfield, Mich.
HS-820 306, Vehicle Safety Research Integration Symposium, Washington, 1973, p311-31
1973 ;
Includes questions and answers.
Availability: In HS-820 306

HS-014 037

SIMPLIFIED ANALYSIS OF STEADY-STATE TURNING BEHAVIOR OF MOTOR VEHICLES. PT. 1. HANDLING DIAGRAMS OF SIMPLE SYSTEMS

An approximate method is presented which produces a handling diagram useful for the study of steady-state turning behaviour at different values of steer angle, path radius and speed. In three successive parts the steady state response of simple and more elaborate vehicle models and the stability of the resulting motion are discussed.

by H. B. Pacejka
Vehicle System Dynamics v2 n3 p161-72 (Nov 1973)
1973 ; 9refs
Availability: See serial citation

HS-014 038

A COMBINED ACCELERATOR-BRAKE PEDAL

This paper describes a combined accelerator and brake in one pedal which may be a technique for reducing automotive accidents. Its use is not limited to automobiles, but can be used in any type of automotive vehicle. Reaction time, from onset of an accident stimulus until the brakes are initially applied, is 0.256 seconds with this one pedal system, versus 0.468 seconds under the conventional two pedal accelerator-brake system. This saving of over 45 percent in reaction time, results in the brakes of a vehicle being applied about 19 feet earlier at 60 mph for example. In addition, the driver would have this much more room to swerve and possibly avoid an otherwise serious situation ahead.

by G. K. Poock; A. E. West; T. J. Toben; P. T. Sullivan
Ergonomics v16 n6 p845-8 (Nov 1973)
1973 ; 4refs
Availability: See serial citation

HS-014 039

A MODEL OF VEHICLE COMFORT AND A METHOD FOR ITS ASSESSMENT

Questionnaires were provided to large groups of people travelling in a hovercraft and on a local bus service. The results from these questionnaires were compared with a paired comparison experimental procedure using 24 subjects. The paired comparison procedure was designed to assess preference for various modes of transport and preferences for certain qualities of the passenger environment in these transports. Differences and similarities between the two methods of assessment are discussed.

by I. Manenica; E. N. Corlett
Ergonomics v16 n6 p849-54 (Nov 1973)
1973 ; 3refs
Availability: See serial citation

HS-014 040

THE DEVELOPMENT OF QUESTIONNAIRE SURVEYS FOR THE INVESTIGATION OF PASSENGER COMFORT

The usefulness of the questionnaire as a tool for obtaining information concerning passenger comfort from the passengers themselves is explored. An appropriate questionnaire, developed at Swansea has been used as an illustration. While many pitfalls may exist in the interpretation of the data, it is argued that with careful consideration both of the questionnaire construction and the analysis, useful information may be obtained. Such information may be used as an indicator for further research and as a valid pointer to the subjective feelings of the passenger.

by D. J. Oborne; M. J. Clarke
Ergonomics v16 n6 p855-69 (Nov 1973)
1973 ; 3refs
Sponsored by the Science Res. Council of Great Britain.
Availability: See serial citation

HS-014 041

TRAFFIC CRASH INVESTIGATION AND REPORT MANUAL FOR ILLINOIS POLICE. REV. ED.

The report presents the section of the Illinois Vehicle Code setting forth the legal requirements for traffic accident reporting and instructions to police officers for completing reports. Samples of report forms are given, with detailed instructions for filling them out as well as instructions for the conduct of an investigation, methods of questioning witnesses, and personal attitudes and conduct.

by Anonymous
Illinois Univ., Urbana
1973 ; 75p
Revised 7 May 1973.
Availability: Corporate author

HS-014 042

A METHOD FOR DETERMINING THE NOISE LEVELS AND PERFORMANCE PARAMETERS FOR TRUCK COOLING FANS

A test method for accurately determining the noise levels of truck cooling fans, as a function of their performance, is described. Correlation between the calculated results using this method and experimental results of tests with a simulated truck cooling system environment is demonstrated. Since fan noise is a major component noise source for trucks, this procedure is of interest to engineers involved in meeting legislated vehicle noise levels.

by S. O. Fleischer
General Motors Proving Ground, Milford, Mich.
Rept. No. SAE-730680 ; 1973 ; 10p 6refs
Presented at Combined Commercial Vehicle Engineering and Operations and Powerplant Meetings; Chicago, 18-22 Jun. 1973.
Availability: SAE

HS-014 043

NEW RESEARCH ON STEEL-BELTED RADIAL TIRES FIGHTS THE HAZARDS OF RAIN-SLICK ROADS

Research on the effect of steel-belted radial tires on rain-slick roads is reviewed, including tire and automobile industry programs and suggestions for the individual driver. Test equipment and technology are examined. Aspects of radials that reduce skidding focus on the radial footprints, rubber compounds, and special ingredients not possible in conventional tires. Tread wear checks and worn tire replacement are suggested for the driver along with maintaining proper air pressure and avoiding mixing tire types on the same car.

by J. P. Norbye; J. Dunne
Popular Science v202 n5 p72-5 (May 1973)
1973 ; 4p
Availability: See serial citation

HS-014 044

LAMP EXAMINATION FOR ON OR OFF IN TRAFFIC ACCIDENTS

General aspects of lamp examination to determine whether they were on or off at the time of a traffic accident are reviewed. Several areas are considered: circumstances warranting lamp examination; the normal lamp, including appearance, principle of operation, and aging; the effect of collision on lamps; special considerations such as tampering, short circuits, rollover, direction of impact, or weather exposure; examining lamps and testing circuits; handling and storing lamps; lamps commonly used on motor vehicles; and experiments and collections.

by J. S. Baker; T. Lindquist
Northwestern Univ., Evanston, Ill. Traf. Inst.
Rept. No. P.N.82 ; 1972 ; 33p 12refs
Advanced Accident Investigation Series. Revision of unpublished report: Examination of Automobile Lamps for Traffic-Accident Investigation, Oct. 1964, Contract CPR-11-0879.
Availability: Corporate author

HS-014 045

A STUDY OF THE RELATIONSHIPS AMONG FATIGUE, HOURS OF SERVICE, AND SAFETY OF OPERATIONS OF TRUCK AND BUS DRIVERS. FINAL TECHNICAL REPORT

The relationships among fatigue, hours of service, and safety of operations of truck and bus operators were investigated through a critical review of research pertaining to driver fatigue and alertness; an opinion survey of professional drivers and transportation industry officials concerning current practices and regulations related to hours of service; an analysis of accident data from several major carriers from the viewpoint of possible fatigue-related causes; and an empirical investigation of the effects of hours on the road, rest breaks, type of operation, time of day, and driver age on certain measures of driver performance and physiological states associated with fatigue and alertness. The resulting data are presented within the framework of current DOT regulations governing hours of service of truck and bus drivers engaged in interstate operations.

by W. Harris; R. R. Mackie; C. Abrams; D. N. Buckner; A. Harabedian
Human Factors Res. Inc., Goleta, Calif.
Contract DOT-FH-11-7777
Rept. No. PB-213 963; 1727-2; BMCS-RD-71-2 ; 1972 ; 249p 53refs
Rept. for Jun 71-Nov 72 on Phase 1 and 2.
Availability: NTIS

HS-014 046

DETAILED DESIGN: RANKINE-CYCLE POWER SYSTEM WITH ORGANIC-BASED WORKING FLUID AND RECIPROCATING EXPANDER FOR AUTOMOBILE PROPULSION. VOL. 1. TECHNICAL REPORT

The system is based on use of an organic-based working fluid with reciprocating expander. The working fluid is Fluorinol-85, a mixture of 85 mole percent trifluorinol and 15 mole percent water. The detailed, optimized design of the system including packaging of the complete system in the reference car of the 1972 Ford Galaxie is described. The results of experimental development in several critical areas are also presented. The measurements confirmed the low emission potential of the Rankine-cycle system. Only low-cost materials are used and the system design is adaptable to high volume production techniques.

HS-014 047

by Anonymous
Thermo Electron Corp., Waltham, Mass.
Contract EHS-70-102
Rept. No. PB-210 836; APTD-1154; 4134-71-72 ; 1972 ; 271p refs
Report for 6 May 70-5 Nov 71.
Availability: NTIS

HS-014 047

INVESTIGATION OF THE CORNERING DYNAMICS OF A MILITARY TIRE. FINAL REPORT

A review of a particular theoretical tire dynamics model is presented leading to a prediction of side thrust as the result of combined slip angle and camber angle with load as the major parameter. An experimental program to test these predictions was accomplished using 7.00-16 NDCC military tires mounted on a solid axle, unsprung toe-in trailer. The theoretical predictions did not compare well with the experimental results.

by J. E. Longhouser
Stevens Inst. of Tech., Hoboken, N.J.
Contract DAAE-07-69-0356
Rept. No. AD-747 349; SIT-DL-72-1609; R-1609 ; 1972 ; 74p 27refs
Availability: NTIS

HS-014 048

AN ACCIDENT AND ENFORCEMENT STUDY (CONDENSATION) OPERATION 101

A condensation of an accident and enforcement study in California, Operation 101, is presented. The study was to determine if additional traffic officer presence and law enforcement actions result in fewer driving violations and accidents. Three measures of prime importance to the study were change in manpower, change in driver violations, and change in accidents. The hypothesis was supported, and additional findings revealed the effects of rainfall, drunken driving, law enforcement, speeding, and violations on accident frequency.

by Anonymous
California Dept. of Hwy. Patrol, Sacramento, Calif.
Rept. No. CHP-7-72-300 ; 1972 ; 16p
Availability: Corporate author

HS-014 049

DYNAMIC OPTIMIZATION OF VEHICULAR STRUCTURES

Optimal design of military vehicular structures with respect to their dynamic performance is considered. The problem of optimal design is stated precisely in mathematical terms in view of the vehicular models developed in Themis Report No. 37. The iterative optimization procedure is based on the necessary conditions of the calculus of variations. A simple two degrees of freedom model is considered and a minimax principle is used which reduces the problem to that of finite dimensional nonlinear programming problem. The objective function for this problem consists of various absolute maximum values of velocities and accelerations. The results for various cases of this problem are presented, and the listing of the computer program is given.

HSI 74-7

by J. S. Arora
Iowa Univ., Iowa City
Contract DAAFO3-69-C-0014
Rept. No. AD-741 393; THEMIS-40 ; 1972 ; 36p 8refs
Rept. on Proj. Themis: Vibration and Stability of Military Vehicles.
Availability: NTIS

HS-014 050

AUTOMOBILE GAS TURBINE ENGINE STUDY FOR THE ENVIRONMENTAL PROTECTION AGENCY. SUMMARY REPORT

The optimum gas turbine powerplant system for a standard six passenger automobile is described. The major goals for the gas turbine automobile are to meet the 1976 Federal Emissions Standards and be similar to, or better than, the present automobile with respect to acceleration, performance, initial consumer cost, fuel economy, and maintenance and repair costs. Through proper design, a gas turbine engine/transmission system can be mass-produced at an estimated cost comparable to a 1970 spark ignition (SI) system. The optimum gas turbine (GT) system has a lower computed average fuel consumption that the 1970 SI system and the GT system vehicle acceleration response would equal or exceed the SI system. Engine cycles were not penalized for low-emission combustor designs. All of the engines met the CO and UHC requirements with margin, but none of the conventional combustors met the NOx requirement. Schematics of the systems are presented and design point characteristics tabulated.

by Anonymous
AiResearch Mfg. Co. of Arizona, Phoenix
Contract 68-04-0012
Rept. No. PB-223 329; APTD-1546; AT-6100-R8-Rev-1 ; 1972 ; 19p
Availability: NTIS

HS-014 051

AN EVALUATION OF THE DRIVE TEST AS AN EXAMINATION REQUIREMENT FOR DRIVERS PREVIOUSLY LICENSED IN ANOTHER STATE

The on-the-road drive test as an examination requirement for drivers previously licensed in another state to receive a California drivers license is evaluated. Data were collected on 15,012 out-of-state applicants given the drive test, and on 23,647 applicants who had the drive test waived. Comparisons revealed no significant differences between the groups on number of accidents, fatal and injury accidents, or convictions. The results also did not support differential licensing standards for different age groups or for different states. Elimination of the drive test requirement for out-of-state applicants would save 198,000 drive tests per year for an annual savings of $381,000.

by D. M. Harrington
California Dept. of Motor Vehicles, Sacramento
Rept. No. RR-44 ; 1973 ; 24p
Availability: Corporate author

HS-014 052

CURV: A HEADLAMP RESEARCH PROGRAM FOR FITTING DATA DEFINED OVER A PARTICULAR GRID TO ONE OR MORE SPECIFIED EQUATIONS

The CURV program is presented as a headlamp research program to determine a generating function in the form of a simple polynomial or exponential equation which describes a surface defined over a uniform grid, and to use this function to extend the range of the grid surface. The grid surface is discussed along with the various features incorporated into the process of fitting the data, an analysis of the program structure, and a note regarding its implementation. Appendices are included which give the source listing for the program and a sample execution of it.

by A. L. Harrison
National Aeronautical Establishment, Ottawa, Ont. (Canada)
Rept. No. LTR-ST.604; NAE-1530 ; 1972 ; 119p
Availability: Corporate author

HS-014 053

THE MEASUREMENT OF DRIVER PERFORMANCE

Driver performance was measured in an experiment which examined general characteristics of different control movements and the use of these movements to distinguish between a more experienced and a less experienced group of drivers. It was found that there were no significant differences between the two groups studied (a total of 12 people) in total number of steering reversals, density encountered running time, stopped time, speed, cars passed or passing. There was a detectable difference in consistency between the less and more experienced groups.

by A. M. Smiley
National Aeronautical Establishment, Ottawa, Ont. (Canada)
Rept. No. LTR-ST.638; NAE-1530 ; 1973 ; 13p 9refs
Availability: Corporate author

HS-014 054

QUESTIONNAIRE TECHNIQUES IN TRAFFIC SAFETY RESEARCH: A DIGEST OF CALIFORNIA DEPARTMENT OF MOTOR VEHICLES EXPERIENCE

Experience regarding questionnaire content, contact strategy, response, non-response and non-recipiency rates in California Department of Motor Vehicles studies using questionnaires as a data collection tool is compiled. The contribution of questionnaires to each of 10 DMV studies is discussed along with the efficiency of various response maximization procedures.

by W. V. Epperson
California Dept. of Motor Vehicles, Sacramento
Rept. No. PB-223 490; CAL-DMV-RSS-73-43 ; 1973 ; 134p
Availability: NTIS

HS-014 055

COMPUTER SIMULATION OF A VEHICLE OCCUPANT IN A CRASH

Essential and desirable attributes of occupant simulation programs are developed and applied to evaluate five occupant simulation programs. Evaluation conclusions are presented: there is no single program adequate for realistic simulation studies; SIMULA is the better two-dimensional program; it is possible that an acceptable three-dimensional program might be a composite of SIMULA, UCIN, and CAL3D. The modifications made to the selected program to correct errors, improve maintainability, and enhance user convenience are discussed.

by R. N. Karnes; J. L. Tocher
Boeing Computer Services, Inc., Seattle, Wash.
N00014-72-C-0223
Rept. No. AD-763 452; BCS-G0331 ; 1973 ; 64p
Availability: NTIS

HS-014 056

HYDRODYNAMIC DECELERATING BRAKE CONTROL SYSTEM

A hydrodynamic braking control system consists of closed hydraulic circuit forming a working space for the hydraulic moderator, working medium cooler, suction and feed pipes, make-up tube, power tubes, distributor valve and controlling member connected to the valve. It is distinguished by providing the system with an additional hydraulic circuit consisting of channels connecting the suction side to the pressure side of the main circuit through a distributor valve. The plunger of the distributing (pilot) valve is made with a collar for throttling the channels of the additional hydraulic circuit on putting the hydraulic moderator on. This regulates the braking moment on the rotor at constant pressure in the make-up tube.

by N. K. D'yachkov; D. T. Gapoyan; A. S. Kichzhi
Foreign Technology Div., Wright-Patterson AFB, Ohio
Rept. No. AD-747 386; FTD-HT-23-270-72 ; 1972 ; 10p
Edited translation of USSR Patent No. 261929, 1970.
Availability: NTIS

HS-014 057

MATERIALS FOR USE IN IMPLEMENTING THE WRITTEN SAFETY EXAMINATION REQUIREMENT. FINAL REPORT--SUPPLEMENTARY DATA

Written examinations on the Motor Carrier Safety Regulations submitted in conjunction with Report No. BMCS-RD-71-1a, The Development of Written Examinations on the Motor Carrier Safety Regulations are presented. Other materials for use in implementing the tests, such as instruction, answer sheets and a draft certification of written examination are included.

by Anonymous
Richardson, Bellows, Henry and Co., Inc., Washington, D.C.
Contract FH-11-7807
Rept. No. PB-212 709 ; 1972 ; 80p
Availability: NTIS

HS-014 058

EFFECTIVENESS OF GLARE SCREENS. FINAL REPORT

Available literature on glare screens, including plantings and fencing, is reviewed and selected installations described. It is found that glare screens are effective but that warrants have not been established for their use. Expanded metal meshes are the most satisfactory of the available alternatives, and a modular system of erection is preferred. Possible areas for additional research include development of warrants and evaluation of the interaction of glare screens and flexible median barriers.

by J. T. Capelli
New York (State) Dept. of Transportation, Albany
Rept. No. NYSDOT-ERD-73-RR13 ; 1973 ; 42p 51refs
Research Project 52-1 conducted in cooperation with the U.S. Department of Transportation, Federal Highway Administration.
Availability: Corporate author

HS-014 059

VEHICLE OCCUPANT INJURY CLASSIFICATION

A new procedure for classifying individual occupant injuries was derived from the Collision Performance and Injury Report (CPIR) and the NATO Collision Analysis Report Form that permits the correlation of injury sources (contact areas) and specific injuries. The Occupant Injury Classification (OIC) follows an approach similar to the Collision Deformation Classification. Four dimensions are described: body region, aspect, lesion, and body system/organ. The OIC is terminated with an Abbreviated Injury Scale severity number. The injuries of 7000 vehicle occupants are reported on the CPIR and stored in time-shared computer files for analysis from remote terminals. This existing system of recording occupant injuries is described briefly as a basis for establisheding the new OIC.

by J. C. Marsh, 4th
HIT Lab Reports v4 n1 p1-11 (Sep 1973)
1973 ; 11p 11refs
Availability: See serial citation

HS-014 060

THE RELATIONSHIP OF BICYCLE MANEUVERABILITY TO HANDLEBAR CONFIGURATION

The growing use of bicycles by all age groups coupled with their involvement in numerous accidents has increased the impact of bicycles as a highway safety problem. Since the handling characteristics of bicycles can affect their safety, the present experiment evaluated the maneuverability of three basic handlebar configurations: racing (drop), standard and high rise. The performance observed on the bicycles with high rise and standard handlebar configurations indicated they were not significantly different from each other. On the circle, figure 8, and slalom tasks, performance with both the high rise and standard handlebars was significantly better than the race. The high rise showed a slight performance edge on tasks requiring the greatest amount of maneuvering, while the standard handlebars offered more control at slower speeds, and on tasks requiring stability in tracking.

by R. G. Mortimer; P. A. Domas; R. E. Dewar
Michigan Univ., Ann Arbor. Highway Safety Research Inst. Ann Arbor
Rept. No. PB-222 843; UM-HSRI-HF-TM-73-5 ; 1973 ; 40p 6refs
Availability: NTIS

HS-014 061

ESTIMATING AUTO EMISSIONS OF ALTERNATIVE TRANSPORTATION SYSTEMS. FINAL REPORT

The development and application of a model which can estimate the magnitudes of carbon monoxide, hydrocarbons, and oxides of nitrogen automobile emissions for alternative transportation systems are discussed. The model consists of three distinct phases: an auto vehicle trip origin sub-model, a submodel which produces forecasts of auto travel characteristics, and an emission level estimator. It produces estimates at the subarea level. Results of applying the model to the Washington, D.C. Region are discussed. This application studied the effects of both alternative highway and transit systems on 1976 emissions within the region. The methodology is designed for adaptation to other metropolitan areas.

by S. D. Berwager; G. V. Wickstrom
Metropolitan Washington Council of Governments, Washington, D.C.
Rept. No. PB-208 914; DOT-OS-20004 ; 1972 ; 85p refs
Prepared for Office of the Assistant Secretary for Environment and Urban Systems, Washington, D.C.
Availability: NTIS

HS-014 062

VEHICLE DYNAMICS FOR AUTOMATIC BRAKING SYSTEMS

Analyses of car-following automatic braking criteria are presented to establish automobile trajectories as a function of time as well as distance. A closed form solution was not found, but numerical methods were used to solve the equation. The method of solution is described.

by R. M. Storwick
General Motors Research Labs., Warren, Mich.
Rept. No. GMR-1510 ; 1973 ; 16p 1ref
Prepared for IEEE Transactions on Automatic Control.
Availability: Corporate author

HS-014 063

COMPARISONS OF FULL-SCALE EMBANKMENT TESTS WITH COMPUTER SIMULATIONS: VOL. 1, TEST RESULTS AND COMPARISONS. INTERIM REPORT

Six full-scale tests of an instrumented automobile were conducted on an embankment for various combinations of vehicle encroachment speed and encroachment angle. The embank-

ment, on Texas State Highway 21, consisted of a 3.5:1 side slope and a relatively flat bottom ditch approximately 20 feet below the paved roadway. Each test was simulated by the Highway-Vehicle-Object-Simulation-Model, a computer program, and the results were then compared with the measured test results. With the exception of the tests in which suspension failures occurred in the test car, the correlation between the measured and predicted data was good.

by H. E. Ross, Jr.; E. R. Post
Texas A and M Univ., College Station. Texas Transp. Inst.
Rept. No. PB-222 866; TTI-2-5-69-140-7 ; 1972 ; 119p 6refs
Rept. for Sep 1968-Dec 1972. Sponsored by Texas Hwy. Dept. in cooperation with Dept. of Transp. and Federal Hwy. Administration. Rept. on study entitled: Evaluation of the Roadway Environment by Dynamic Analysis of the Interaction Between the Vehicle, Passenger and Roadway.
Availability: NTIS

HS-014 064

DIESEL ENGINE NOISE REDUCTION HARDWARE FOR VEHICLE NOISE CONTROL

A range of noise reduction hardware is described for three production engine models, as well as the rationale for selecting noise reduction methods for diesel trucks. Noise reductions up to 6 dB(A) were achieved with this hardware in the test cell. In many cases the modifications are more effective in vehicles. The success of the hardware in reducing overall vehicle noise is illustrated.

by S. H. Jenkins; H. K. Kuehner
Cummins Engine Co., Inc., Columbus, Ohio
Rept. No. SAE-730681 ; 1973 ; 12p 15refs
Presented at Combined Commercial Vehicle Engineering and Operations and Powerplant Meetings, Chicago, Ill., 18-22 Jun 1973.
Availability: SAE

HS-014 065

REDUCING NOISE FROM HEAVY DIESEL TRUCKS BY ENGINE COMPARTMENT SHIELDING

Significant noise reduction in diesel trucks is achieved by means of soundly designed shielding, without modifying the basic design. The reduction attained in the noise emission is approximately 6 dB(A). Inconvenience during repairs and service is reduced to a minimum by a well-planned design and simple mounting of the shields as well as ample exposure of the engine when the cab is tilted.

by J. Ronnhult
Saab-Scania A.B. (Sweden)
Rept. No. SAE-730682 ; 1973 ; 11p 5refs
Presented at Combined Commercial Vehicle Engineering and Operations and Powerplant Meetings, Chicago, Ill., 18-22 Jun 1973.
Availability: SAE

HS-014 066

COMPARATIVE TESTS OF TRUCK COMPRESSED AIR DRYERS

Comparative test results are presented covering four types of truck compressed air dryers: aftercoolers, centrifugal filters, dessicant dryers, and wet tank heat exchangers. The operating characteristics of each under varying conditions expected in truck usage are discussed. Test results show that, except for unusually slow vehicles with heavy brake use, the wet tank exchanger is the best overall dryer available, usable even on slow moving delivery trucks. The aftercooler is second best and can be used on slow vehicles with excellent results.

by M. Hunsaker
Royal Industries, Santa Ana, Calif.
Rept. No. SAE-730684 ; 1973 ; 7p
Presented at Combined Commercial Vehicle Engineering and Operations and Powerplant Meetings, Chicago, Ill., 18-22 Jun 1973.
Availability: SAE

HS-014 067

AIR BRAKE COMPRESSOR DESIGN FOR EXTENDED LIFE AND HIGH PERFORMANCE

A new 2-cyl, reciprocating type air compressor designed as an air source for heavy-duty truck air brake systems is described. The objectives of the new design and how they were met are discussed. A short history of present compressor deficiencies is given, together with recommendations to avoid them. Emphasis is placed on positive design features to control oil consumption and minimize the formation of carbon. Design features to eliminate structural failures on highly stressed, critical components found in present-day air compressors, are also examined.

by D. R. Gross; R. J. Day
Midland-Ross Corp., Cleveland, Ohio
Rept. No. SAE-730685 ; 1973 ; 7p
Presented at Combined Commercial Vehicle Engineering and Operations and Powerplant Meetings, Chicago, Ill. 18-22 June 1973.
Availability: SAE

HS-014 068

DRAG REDUCTION OF BLUFF VEHICLES WITH AIRVANES

An experimental wind tunnel program was conducted to evaluate the drag reduction potential of airvanes located close to the leading and trailing edges of bluff vehicles. The airvanes are modified airfoils that direct an interior portion of the main airflow around a corner. In an optimal design, flow visualization experiments (with tufts) indicate that the outer flow is attached to the exterior vane surface. Front-mounted airvanes reduced the drag of a 1/20 scale square-cornered trailer (or bus) model by 38% for wind speeds between 40 and 120 mph. With a streamlined cab in position, there was a 30% drag reduction. Rear-mounted airvanes provided an additional 3-6% drag reduction, but were found to be prone to interference effects. The study was limited to the zero crosswind condition and only one airfoil shape was evaluated. Of the parameters tested, airvane efficiencies were most sensitive to changes in the stand-off distances between the vane and the model surfaces. In a full-scale configuration, the airvanes need only protrude 1-2 in. from the vehicle sides or roof.

by J. W. Kirsch; S. K. Garg; W. Bettes
Systems, Science and Software, La Jolla, Calif.; California Inst. of Tech., Pasadena
Rept. No. SAE-730686 ; 1973 ; 20p 16refs
Presented at Combined Commercial Vehicle Engineering and Operations and Powerplant Meetings, Chicago, Ill., 18-22 Jun 1973.
Availability: SAE

HS-014 069

AERODYNAMIC EFFECTS OF PASSING VEHICLES

An evaluation of the lateral forces and moments produced on a vehicle with large, flat lateral faces when it is passing or being passed by a large vehicle in an adjacent traffic lane is described. The forces and moments were determined from tests that were conducted in the University of Tennessee subsonic wind tunnel. They were then input to a computerized vehicle model to find the resulting dynamic response of the vehicle. These forces and moments were sufficiently strong to produce a significant lateral deviation from the desired path of the vehicle. Several recommendations for improving highway safety resulted.

by W. S. Johnson; F. H. Speckhart; R. E. Bridwell
Tennessee Univ., Knoxville; Department of the Air Force, Washington, D.C.
Rept. No. SAE-730687 ; 1973 ; 6p 6refs
Presented at Combined Commercial Vehicle Engineering and Operations and Powerplant Meetings, Chicago, Ill., 18-22 Jun 1973.
Availability: SAE

HS-014 070

ANALYSIS OF LATERAL STABILITY FOR DOUBLES

The lateral stability for doubles was analyzed in terms of frequency response and characteristic roots by using simple models. The effect of the loading condition of cargo is most unstable when the first trailer is empty of cargo and the second loaded. Stability is impaired when the trailer's center of gravity is excessively shifted to the rear side. Such loss of stability affects the first trailer more than the second. The stability of each trailer increases in proportion as the wheel base gains in length, and with the increasing cornering power of trailer wheels. For stability, the overhang at the position of the pintle hook should be as short as possible.

by T. Hazemoto
Mitsubishi Motors Corp., Kawasaki (Japan)
Rept. No. SAE-730688 ; 1973 ; 19p 16refs
Presented at Combined Commercial Vehicle Engineering and Operations and Powerplant Meetings, Chicago, Ill., 18-22 Jun 1973.
Availability: SAE

HS-014 071

WHICH SPRING? WHERE?

Applications of principles to be considered in selecting springs for commercial vehicles are discussed, and many types of springs are compared, including single leaf, multileaf, and two-stage leaf springs, and coil, rubber, and pneumatic springs. Among the considerations stressed are: the relationships of spring static deflections to vehicle pitch frequency and oscillation center location, the questionability of two-stage leaf springs, the disadvantages of single tapered leaf versus multi-leaf springs, the advantages of coil springs in low weight and variable rate, and why pneumatic springs are ideal for large load range, heavy commercial vehicles.

by R. N. Janeway
Janeway Engineering Co., Troy, Mich.
Rept. No. SAE-730689 ; 1973 ; 10p 5refs
Presented at Combined Commercial Vehicle Engineering and Operations and Powerplant Meetings, Chicago, Ill., 18-22 Jun 1973.
Availability: SAE

HS-014 072

DETERMINING OPTIMUM V-BELT REPLACEMENT MILEAGE

V-belt replacement costs on alternator, air-conditioning, and power steering drives can be reduced significantly in installing new belts at a time established by an age or block replacement plan, instead of waiting for belt failure. Methodology and a realistic example are presented for determining such plans and associated cost reductions. The plans are based upon historical belt failure data and upon the increase in after-failure replacement costs over those resulting from scheduled replacement prior to failure.

by L. R. Oliver
Dayco Corp., Springfield, Mo.
Rept. No. SAE-730690 ; 1973 ; 6p 2refs
Presented at Combined Commercial Vehicle Engineering and Operations and Powerplant Meetings, Chicago, Ill., June 18-22, 1973.
Availability: SAE

HS-014 073

HIGH SPEED UNIFORMITY MACHINES AND NATURE OF TIRE FORCE VARIATIONS

High speed tire uniformity machines may be used to measure three-dimensional tire force variations (tire uniformity) that may not be measured at low speeds. Prototype machines are described and some inherent problems outlined. Typical tire force variations, the influence of certain variables on these force variables, and the significance of these force variations are given.

by C. Hofelt, Jr.; K. J. Gormish; D. A. Corcoran
General Tire and Rubber Co., Akron, Ohio
Rept. No. SAE-730691 ; 1972 ; 31p 9refs
Presented at National Automobile Engineering Meeting, Detroit, Mich., May 22-26, 1972.
Availability: SAE

HS-014 074

AN EVALUATION OF STATE DRIVER MANUALS

The basic function of state instruction manuals for drivers is to prepare the license applicant for the driver's examination and to give licensed drivers a source of reference for driving information. A study undertaken recently to measure the adequacy of these manuals concluded that changes should be undertaken to increase the utility and readability of driver manuals. Suggestions for improvement are made such as:

omission of words, phrases and legal phraseology; a complete index and table of contents; effects on the driver of alcohol, drugs, fatigue and emotion; better illustrations of driving maneuvers, symbols and pavement markings; and benefits of wearing seat and shoulder belts.

by H. C. Nuckols, Jr.; J. E. Clark
Traffic Quarterly v28 n1 p37-48 (Jan 1974)
1974 ; 12p 5refs
Availability: See serial citation

HS-014 075

EVALUATION OF A PROGRAM TO REHABILITATE DRUNKEN DRIVERS

Changes in knowledge and attitude relating to driving after drinking were measured for the first nine classes of the Westchester, New York, DWI-Counterattack program for one year. Instruments for measuring change included a knowledge inventory and an attitude test. A simple pretest-posttest design was employed; employed; no control groups or random procedures were utilized. Knowledge and attitude relating to alcohol and driving were shown to be significantly improved following the DWI-Counterattack course.

by J. L. Malfetti; K. J. Simon
Traffic Quarterly v28 n1 p49-59 (Jan 1974)
1974 ; 11p 14refs
Availability: See serial citation

HS-014 076

PUNISHMENT AND TRAFFIC OFFENSES

The deterrent effect of punishment in traffic offenses is evaluated in a survey of the offense records of 1638 randomly selected drivers. Six variables were measured: total offenses per driver; year of first offense; time lapse between first and second offenses; time lapse between offense and punishment; gravity of offenses; and type and severity of punishment. It was found that the large volume of traffic offenses was not related to the light punishments generally incurred, and severe punishment was found to be positively correlated with recidivism. It is hypothesized that certain drivers lack basic driving ability. It is also suggested that it is possible to identify a recidivist offender lacking driver ability in the early stages.

by S. G. Shoham
Traffic Quarterly v28 n1 p61-73 (Jan 1974)
1974 ; 13p
Sponsored by the Israeli Ministry of Transportation.
Availability: See serial citation

HS-014 077

MOTOR CARRIER ACCIDENT INVESTIGATION. VIRGINIA TRANSPORTATION COMPANY ACCIDENT - JUNE 8, 1973 - NEAR DUMFRIES, VIRGINIA. 6 KILLED, FIRE ENSUED

Collision of a tractor semitrailer with a station wagon resulted in six fatalities and five injuries. Failing to allow sufficient distance between his truck and the vehicle ahead of him to compensate for slower moving vehicles and unexpected actions of other drivers, the truck driver skidded approximately 125 feet prior to colliding and overriding the left rear of the slower moving station wagon. Momentary distraction of the driver while traveling at a high rate of speed was a contributing factor. Had the truck been operated in a defensive manner the accident might have been avoided.

by Anonymous
Bureau of Motor Carrier Safety, Washington, D.C.
Rept. No. 73-6 ; 1973 ; 10p
Availability: Corporate author

HS-014 078

SOME HARD DATA RELATIVE TO HIGHWAY LOSSES IN DAMAGED PEOPLE AND PROPERTY AND CHANGES THAT MIGHT RESULT FROM THE ENERGY SHORTAGE

Aspects of the energy crisis which can affect highway losses in damage to people and property are examined. Only known facts are considered, and the overall effect is not speculated. Aspects that are changing are vehicle size and speed. Passenger car mileage, vehicle occupancy rates, speed limits, motorcycle and bicycle usage, use of supplemental gasoline containers, age of vehicle population, restrictions on young drivers, restraint usage, street lighting, and the economy are all contributing factors. Without dramatic decreases in vehicle fragility and increases in restraint usage or other improved occupant protection measures, the trend towards smaller cars will result in long term increases in both damaged people and property.

by Anonymous
Insurance Inst. For Hwy. Safety, Washington, D.C.
1973 ; 47p 13refs
Includes excerpts from the IIHS Status Report.
Availability: Corporate author

HS-014 079

AN EVALUATION OF THE EFFECTIVENESS OF SIDE-DOOR BEAMS BASED ON ACCIDENT EXPOSURE

An evaluation of the injury reducing effects of side-guard door beams is presented based on accident investigation reports. The evaluation considers two measures of effectiveness: the mean injury severity recorded for the occupants, and the degree of deformation in the door. In each case the analysis controls on contributing factors such as occupant seating location, restraint use, side of the car damaged, and the angle of the impact force. In both cases, results show that it cannot be concluded that side door beams produce an effect on injuries, or on door penetration.

by F. Preston; R. Shortridge
Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
Rept. No. UM-HSRI-SA-73-8 ; 1973 ; 43p 10refs
Special Report prepared for the Motor Vehicle Manufacturers Assoc., Inc., Detroit, Mich.
Availability: Corporate author

HS-014 080

VEHICLE NOISE STUDY. FINAL REPORT

Vehicle noise levels are studied for guidance in proposing noise control legislation in the state of Washington. Emphasis

is on trucks traveling on roads with posted speeds above 35 mph, although data is also given for automobiles and for lower speeds. Noise level and the speed of all vehicles were measured, and trucks over 10,000 lbs were weighed. The data are graphed to illustrate various aspects, including how the noise factor varies with speed, weight, and percentage of full load. Photographs are also included. The data generally show that the noise level does increase with truck weight and speed, but the range of variability is great.

by R. N. Foss
Washington Univ., Seattle
Grant Y-1460
1972 ; 185p
Prepared for Washington State Highway Commission.
Availability: Corporate author $5.00

HS-014 081

WEAK POINTS OF CARS, 1973

Statistical analyses of periodic inspections of passenger cars during the first quarter of 1973 are given, with a separate account of the faults in the 1971, 1968, and 1965 models. The results of the analyses are presented mainly in the form of relative remark frequencies (percentages) for different vehicle component systems and for different kinds of vehicles. High remark frequencies are considered to indicate weak points in vehicles. A written description of the nature of the common faults is also provided.

by Anonymous
Svensk Bilprovning, A.B., Stockholm (Sweden)
1973 ; 165p
Availability: Corporate author

HS-014 082

INJURY CONTROL. ACCIDENT PREVENTION AND OTHER APPROACHES TO REDUCTION OF INJURY

The role of accident prevention and other approaches to injury reduction is reviewed from a general viewpoint. Following presentation of conceptual frameworks, consideration is given to the magnitude of the problem, epidemiology, the role of public agencies, and choice and evaluation of countermeasures. Emphasis is placed on the results of acute interactions between man and the physical and chemical hazards of his environment. Adverse responses to drugs as well as injuries to the tissues that result from interference with normal energy exchanges are also included. The term injury control is used in preference to accident prevention to convey a clearer idea of the basic problem.

by S. P. Baker
Preventive Medicine and Public Health 10th ed.
1972 ; 32p 103refs
Preprint.
Availability: Insurance Inst. for Highway Safety, Watergate 600, Washington, D.C. 20037

HS-014 083

JAIL SENTENCES FOR DRIVING WHILE INTOXICATED IN CHICAGO: A JUDICIAL ACTION THAT FAILED

The effect on fatalities in Chicago of the use of seven-day jail sentences as a countermeasure against driving while intoxicated during the winter and spring of 1971 is examined. The interrupted time-series model was used. Arrests and processing of cases are also reviewed, based on data collected from police, coroner, and court records. The changes in fatalities are found to be only a chance variation from the fatality rate over the preceding five years.

by L. S. Robertson; R. F. Rich; H. L. Ross
Insurance Inst. for Hwy. Safety, Washington, D.C.
1972 ; 14p 21 refs
Prepared for publication in Law and Society Review.
Availability: Corporate author

HS-014 084

SPEED AND CAR CRASHWORTHINESS: UNFIXING A GREAT GULF

Research and analysis on speed control and car crashworthiness are discussed with focus on the gap between car and road design and the speed capabilities of of cars. Legislative suggestions are offered, which include cleaning up roadsides, increasing vehicle crashworthiness, and reducing speed production capabilities by setting speed ceilings for new cars.

by A. B. Kelley
Insurance Inst. for Hwy. Safety, Washington, D.C.
1973 ; 25p 21refs
Prepared for presentation to the Section on Injury Control and Emergency Health Services, American Public Health Association, San Francisco, Calif., Nov. 6, 1973.
Availability: Corporate author

HS-014 085

TOWARD ACCIDENT REDUCTION INNOVATIONS IN DRIVER EDUCATION. FINAL REPORT

Emotional role-playing, demonstration, modeling, and reciprocal inhibition were three behavioral modification techniques used to try to develop a curriculum unit which would introduce the element of emotional control while driving into driver education courses with the ultimate aim of reducing the accident rates of young people. Preliminary trials were made using emotional role-playing and demonstration techniques, and two quasi-experiments combined them with modeling and reciprocal inhibition into one curriculum element. Rural and inner-city high school students and university subjects from low and lower middle socio-economic families were studied in the preliminary trials and quasi-experiments. Emotional role-playing had no effect on changing their attitudes and behavior, but modeling and reciprocal inhibition and demonstration were effective.

by M. K. Shapiro
Joint Hwy. Res. Proj. Lafayette, Ind.
Rept. No. JHRP-30 ; 1972 ; 287p 204refs
Prepared in cooperation with Indiana State Highway Commission.
Availability: Corporate author, $5.00

HS-014 086

MOTORCYCLE FATALITIES IN SAN DIEGO COUNTY: A STUDY OF DRINKING MOTORCYCLE DRIVERS

A total of 82 motorcycle fatalities involving drinking drivers is surveyed and compared with fatal accidents of non-drinking cyclists. Data from police and coroner reports are used, giving for each case: time, date, location, age, sex, blood alcohol level (BAL), weather conditions, lighting, locality, road conditions, violations, and fault. Charts and tables present the data graphically. Several conclusions are drawn: the ability to operate a motorcycle is impaired at a BAL lower than the California presumptive level of 0.10% weight/volume; collision and coroner reports provide inadequate data; intersection does not generate the majority of fatal collisions; head injuries proved to be the major cause of death; and further research is needed. Recommendations are offered for motorcycle collision reduction.

by W. E. Marsden, Jr.
San Diego County Engineer Dept., Calif.
1972 ; 29p 2refs
Authorized by the Traffic Engineering and Safety Div., San Diego, Calif.
Availability: Corporate author

HS-800 975

ALCOHOL SAFETY ACTION PROJECTS. EVALUATION OF OPERATIONS - 1972. VOL. 3, PROJECT DESCRIPTIONS

Drunk driving continues to be the greatest menace to human life and safety on our Nation's highways. Top priority has been given to Alcohol Safety Action Projects (ASAP) financed by Federal funds and based on a new understanding of the nature of the drinking-driving problem. The ASAP concept was designed as a systems approach to surround the problem drinker with a set of countermeasures designed to identify him on the road, make decisions regarding rehabilitative procedures, and then take action to put these measures into effect. Report is made on the 35 communities which form the nucleus of NHTSA's program.

by Anonymous
National Hwy. Traf. Safety Administration, Washington, D.C.
1973 ; 88p
Availability: Corporate author

HS-800 991

TRAFFIC SAFETY '72. VOL. 2. A REPORT ON ACTIVITIES UNDER THE HIGHWAY SAFETY ACT, JANUARY 1, 1972 - DECEMBER 31, 1972

This second volume describes the 1972 accomplishments in carrying out the purpose of the Highway Safety Act of 1966, as amended, through states and communities and those special programs and research pertinent to this aspect of the national traffic safety effort. It contains information on: highway traffic safety, 1972 (highlights of traffic safety, program administration and funding, national emphasis programs, special programs, manpower development, and standards implementation); technological progress through research (driver performance, alcohol countermeasures; pedestrian safety, driver education, driver licensing, safety belt usage, traffic engineering, and accident investigation); the public's right to know; and the administration of highway safety programs.

by Anonymous
National Hwy. Traf. Safety Administration, Washington, D.C.
Rept. No. PB-226 858 ; 1972 ; 151p
Availability: GPO, $2.00 as stock no. 5003-00144

HS-801 008

MOTOR VECHILE SAFETY DEFECT RECALL CAMPAIGNS. DETAILED REPORTS FROM JULY 1, 1973, TO SEPTEMBER 30, 1973

The document is comprised of correspondence from vehicle manufacturers to the Department of Transportation, dealers, and owners concerning the recall of vehicles with possible defects. Foreign and domestic manufacturers are included. Material is presented without commentary.

by Anonymous
National Hwy. Traf. Safety Administration, Washington, D.C.
Rept. No. PB-226 772 ; 1973 ; 531p
Availability: NTIS

HS-801 010

ANALYSIS OF PROBLEMS ON THE APPLICATION OF RADAR SENSORS TO AUTOMOTIVE COLLISION PREVENTION. FINAL REPORT 0SUMMARY0

For abstract and search terms, see HS-801 011.

by L. E. Wood; R. A. Chandler; B. D. Warner
Office of Telecommunications, Washington, D.C.
Contract DOT-HS-314-3-601
Rept. No. PB-226 084 ; 1973 ; 31p
Rept. for Mar-Nov 1973
Availability: NTIS

HS-801 011

ANALYSIS OF PROBLEMS ON THE APPLICATION OF RADAR SENSORS TO AUTOMOTIVE COLLISION PREVENTION. FINAL REPORT

The results of an investigation of the practicality and technical feasibility of applying radar as a sensor for automatic automotive braking systems are described. Radar signatures of a variety of targets are given which were obtained with a 10 GHz multiple-frequency CW radar. These targets include automobiles, trucks, corner reflectors, pedestrians, and cyclists. Effects of rainfall on radar performance are considered with respect to frequency, rainfall rate, and whether the radar is a CW or pulsed system. An analysis of system performance as affected by road geometry is provided, as is a study of some of the considerations involved in the dynamics of vehicle stopping. The relative desirability of cooperative and non-

cooperative systems are compared on the bases of technical complexity, costs, maintenance, and overall effectiveness. A study is made of possibly hazardous radiation levels resulting from the general use of vehicular microwave radars. Results are given with respect to different radiation standards.

by L. E. Wood; R. A. Chandler; B. D. Warner
Office of Telecommunications, Washington, D.C.
Contract DOT-HS-314-3-601
Rept. No. PB-226 065 ; 1973 ; 368p 19refs
Rept. for Mar-Nov 1973. For summary rept., see HS-801 010.
Availability: NTIS

HS-801 012

EVALUATION OF MOTOR VEHICLE SAFETY STANDARDS. FINAL REPORT

An evaluation is made of the overall effectiveness of the Federal Motor Vehicle Standards as applied to the 1968 to 1972 model year vehicles, with attention to certain groups of closely related standards, and the individual effects of standards. State accident records from Connecticut, Virginia, and Texas are used as the basis of evaluation, plus a literature review of the effects of safety standards. Specific groups of pre-crash factors include windshield wiping and washing, hydraulic brakes, lamps, tires, hood latches, theft protection, and vehicle identification. Crash-phase data relate to occupant protection, head restraints, steering controls, glazing material, door locks, windshield mountings, seat belts, child seating, and side door strength. Post crash information concerns fuel tanks and a comparison of injury experience between model years. All data were combined. The injury reducing effects of these standards for single vehicle crashes is projected to 1985.

by Anonymous
Center for the Environment and Man, Inc., Hartford, Conn.
DOT-HS-246-2-433
Rept. No. PB-226 074; 4135-496 ; 1973 ; 163p 141refs
Rept. for 12 Jun - 30 Sept 1973.
Availability: NTIS

HS-801 013

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS REPORTED TO THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION BY DOMESTIC AND FOREIGN VEHICLE MANUFACTURERS, JULY 1, 1973 TO SEPTEMBER 30, 1973

This tabulation of safety defect recall campaigns includes the make and model, model year, description of the defect requiring manufacturer's corrective action, number of vehicles recalled, date of notification, and identification number. Automobiles, trucks, motor homes, trailers, buses, motorcycles, water heaters, tires, and wheels are included. Status of domestic and foreign campaigns completed as of Jun 30 is also included.

by Anonymous
National Highway Traffic Safety Administration, Washington, D.C.
Rept. No. PB-226 900 ; 1973 ; 40p
Availability: GPO $0.60 AS STOCK NO. 5003-00152

HS-801 018

ANALYTICAL FINITE ELEMENT SIMULATION MODEL FOR STRUCTURAL CRASHWORTHINESS PREDICTION. INTERIM REPORT

The analytical development and appropriate derivations are presented for a simulation model of vehicle crashworthiness prediction. Incremental equations governing the nonlinear elasto-plastic dynamic response of three-dimensional frame structures are derived, where the associated stiffness and compatibility matrices also incorporate large geometry changes. A discussion of yield criteria is given, together with bound type estimates for thin walled cross section beams. The Newmark beta method is then used to solve the equations of motion, and is oriented toward the particular incremental equations typical of the present application.

by J. Rossettos; H. Weinstock; S. Pasternack
Department of Transp., Cambridge, Mass. Transp. Systems Center
Rept. No. DOT-TSC-NHTSA-73-12 ; 1973 ; 65p 16refs
Rept. for Apr-Sep 1973.
Availability: NTIS $6.25

HS-801 019

AUTOMOTIVE RECORDER RESEARCH--DISC RECORDER PILOT PROJECT. VOL. 1. FLEET STATUS AND DATA SYSTEM PROCEDURES. TECHNICAL REPORT

The NHTSA has developed automotive recorders which can measure crash triaxial acceleration/time histories during vehicle collisions. From these acceleration histories (recorded on a magnetic disc), velocity/time histories and velocity change during impact are derived to provide measures of vehicle crash severity. The purpose of developing these recorders is to provide firm unbiased relationships of vehicle crash severity with occupant fatalities and serious injuries from real-world accidents. To date, a total of 1200 recorders has been produced and over 800 have been installed in fleet vehicles. The status of the Disc Recorder Pilot Project as of October 31, 1972 is documented. This volume describes briefly the 30 accidents which have occurred to date and the procedures that have been developed for accident notification, recorder removal and disposition, recorder post-crash calibration, and data encoding, processing and distribution.

by S. S. Teel; S. J. Peirce; N. W. Lutkefedder
National Hwy. Traf. Safety Administration, Washington, D. C.
Rept. No. PB-226 880 ; 1973 ; 62p 10refs
Rept. for 24 Oct 1972-31 Oct 1973.
Availability: NTIS $6.25

HS-801 020

LEGAL ISSUES RAISED BY ORBIS, A MOTOR VEHICLE SPEED DETECTION DEVICE TAKING PHOTOS OF SPEEDERS. INTERIM REPORT

This report reviews the legal basis for certain potential challenges to the use of unmanned mechanical devices which (a) detect motor vehicles exceeding predetermined speed limits, and (b) photograph both the front portion of these vehicles and the faces of their drivers and passengers. In particular, the report is focused on the operation of Orbis, a member of this class of speed-detection devices manufactured by the Boeing corporation. Three aspects of the device's legality are discussed: (1) the question of whether its operation violates individuals' right of "privacy" as protected by the Federal Constitution, State statues, and common-law precedents; (2) the issue to unlawful inequities in traffic-law enforcement, resulting from the device's operational limitations, which permit some speeders to pass by undetected; and (3) the admissibility into evidence in speeding prosecutions of photographs taken by the device.

by D. Glater
Department of Transp., Cambridge, Mass. Transp. Systems Center
Rept. No. DOT-TSC-NHTSA-73-10; PB-226 891 ; 1973 ; 48p 65refs
Rept. for Jan-Jun 1973.
Availability: NTIS

HS-801 028

ALCOHOL, MARIJUANA AND RISK TAKING. FINAL REPORT

The performance of 6 groups of 16 subjects each (marijuana user control, non-user control, .05 BAC alcohol, .10 BAC alcohol, low dose marijuana, and high dose marijuana) were compared on two laboratory analogs of the automobile passing task. Analysis of the data utilized a multiple discriminant analysis, producing statistically significant discrimination between the 6 groups. The first dimension of discrimination was related to judgemental accuracy and was capable of distinguishing the two marijuana treatment groups from the others. The marijuana subjects tend to overestimate time required to complete passes, and showed considerable variability in their estimates. The second discriminant function dimension was labelled riskiness/decisiveness and appeared capable of distinguishing the alcohol groups from the remaining subjects. The alcohol group subjects tended to exhibit patterns of psychomotor performance suggesting a tendency to make snap decisions which were subsequently overridden. No dose responses were found for either alcohol or marijuana.

by V. S. Ellingstad; L. H. McFarling; D. L. Struckman
South Dakota Univ., Vermillion. Dept. of Psychology
Contract DOT-HS-191-2-301
Rept. No. PB-228 850 ; 1974 ; 78p 16refs
Report for Jun 1972.
Availability: NTIS

HS-801 029

RESTRAINT SYSTEMS

A special bibliography on restraint systems lists publications dated 1967 or later. The documents cited are in the NHTSA Technical Reference Division collection; citations and abstracts are those that have previously appeared in the NHTSA publication Highway Safety Literature.

by Anonymous
National Hwy. Traf. Safety Administration, Washington, D.C.
Rept. No. SB-1 ; 1973 ; 86p
Availability: Corporate author

HS-801 030

SEAT/SAFETY BELTS

A special bibliography on seat belts and safety belts is presented, with documents dating from 1967 to October, 1973. Abstracts are included for each entry, and each citation has previously appeared in the NHTSA publication Highway Safety Literature. The documents cited are in the NHTSA Technical Reference Division.

by Anonymous
National Hwy. Traf. Safety Administration, Washington, D.C.
Rept. No. SB-2 ; 1973 ; 80p
Availability: Corporate author

HS-801 031

SHOULDER HARNESSES

A special bibliography on shoulder harnesses is presented, with most of the cited documents, dated 1967 or later. The documents cited are in the NHTSA Technical Reference Division collection. Citations and abstracts have previously appeared in the NHTSA publication Highway Safety Literature.

by Anonymous
National Hwy. Traf. Safety Administration, Washington, D.C.
Rept. No. SB-3 ; 1973 ; 24p
Availability: Corporate author

HS-801 032

HEAD RESTS/RESTRAINTS

A special bibliography on head rests and restraints generally covering documents published from 1967 to October, 1973 is presented. The documents are in the NHTSA Technical Reference Division collection. Citations and abstracts have previously appeared in Highway Safety Literature.

HS-801 033

by Anonymous
National Hwy. Traf. Safety Administraiton, Washington, D.C.
Rept. No. SB-4 ; 1973 ; 11p
Availability: Corporate author

HS-801 033

AIR BAG RESTRAINT SYSTEMS

A special bibliography on air bag restraint systems, generally covering documents published from 1967 to October, 1973, is presented. The documents are in the NHTSA Technical Reference Division collection. Citations and abstracts have previously appeared in Highway Safety Literature.

by Anonymous
National Hwy. Traf. Safety Administration, Washington, D.C.
Rept. No. SB-5 ; 1973 ; 46p
Availability: Corporate author

HS-801 034

CHILD AND INFANT RESTRAINT SYSTEMS AND SEATING

A special bibliography is presented generally covering documents published from 1967 to October, 1973. The documents are in the NHTSA Technical Reference Division collection. Citations and abstracts have previously appeared in Highway Safety Literature.

by Anonymous
National Hwy. Traf. Safety Administraiton, Washington, D.C.
Rept. No. SB-6 ; 1973 ; 13p
Availability: NHTSA

HS-801 040

WASHTENAW COUNTY, MICHIGAN. ALCOHOL SAFETY ACTION PROGRAM. FINAL REPORT

The Washtenaw County, Michigan, Alcohol Safety Action Program (ASAP), a 40-month demonstration program funded by DOT with the objective of reducing the number of alcohol-related crashes and fatalities, is described. Various regulations, laws, penalties, driver and road statistics, transportation, education, and media facilities are outlined along with medical and alcohol services and alcohol consumption. Countermeasures are given in the fields of law enforcement, judiciary, rehabilitation, public information and education, and by the Michigan Department of State. The ASAP was responsible for initiating a Comprehensive Alcoholism Program with state and local funding.

HSl 74-7

by J. Henderson
Washtenaw County Health Dept., Ann Arbor, Mich.
Contract FH-11-7535
1973 ; 92p
Report for 17 Jul 1970 - 31 Oct 1973.
Availability: Corporate author

HS-801 041

WASHTENAW COUNTY 1971, 1972 AND 1973 BAC ROADSIDE SURVEYS. FINAL REPORT

Three roadside surveys of drivers in Washtenaw County, Michigan in 1971, 1972, and 1973 are reported. They were part of the evaluation procedures for the Washtenaw County Alcohol Safety Action Program (WCASAP) and were designed to obtain representative samples of nighttime driving residents. Forty-eight time-location cells were defined throughout the county based on time of night, day of week, traffic volume, and location. Drivers were sampled from 7-9 p.m., 10-12 p.m., and 1-3 a.m. on each of four nights for four consecutive weeks. A short on-site interview was obtained from participating drivers as well as a breath specimen, used to determine blood alcohol concentration (BAC). The major conclusion is that the proportion of drivers with measurable BAC DECREASED EACH year, from 19% to 15% in 1973; the proportion of drivers with BAC of .05 or higher decreased from 10% to 8%.

by C. D. Clark; M. J. Compton; R. L. Douglass; L. D. Filkins
Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
Contract FH-11-7535
Rept. No. UM-HSRI-AL-73-6 ; 1973 ; 66p 6refs
Prepared for the Washtenaw County Alcohol Safety Action Program, Washtenaw County Health Dept., Ann Arbor, Mich.
Availability: Corporate author

HS-801 042

WASHTENAW AND JACKSON COUNTY VOLUNTARY ORGANIZATIONS: 1971 AND 1973 ASAP SURVEYS. FINAL REPORT

Two surveys of voluntary organizations were conducted in Washtenaw and Jackson Counties in Michigan in 1971 and 1973 as part of the evaluation procedures for the Washtenaw County Alcohol Safety Action Program (WCASAP). The counties were similar, but Jackson had no ASAP-like program. Questionnaires were completed by service clubs of the two counties. No significant changes occurred among Washtenaw County service club members with respect to their knowledge about the role of alcohol in highway crashes and about drinking-driving laws, or their attitudes about drinking and driving, or their self-reported driving-after-drinking behavior. The preliminary objective of informing service club members about the existence of WCASAP activities was achieved, although the unusually high level of educational achievement and civic interest of the members facilitated the task.

by M. M. Chapman; A. C. Wolfe
Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
Contract FH-11-7535
Rept. No. UM-HSRI-AL-73-7 ; 1973 ; 39p 1ref
Prepared for the Washtenaw County Alcohol Safety Action Program, Washtenaw County Health Dept., Ann Arbor, Mich.
Availability: Corporate author

HS-801 043

WASHTENAW COUNTY PHYSICIANS: 1971 AND 1973 ASAP SURVEYS. FINAL REPORT

Two surveys of physicians were conducted in Washtenaw County, Michigan in 1971 and 1973 as part of the evaluation procedures for the Washtenaw County Alcohol Safety Action Program (WCASAP). They were designed to obtain baseline and comparison data on knowledge, attitudes, and behavior concerning the drunk driving problem in the county. A total sample of 187 psychiatrists, internists, and general practitioners was obtained in 1971; 165 in 1973. The effect of the ASAP public information campaign is found to be only marginal with respect to increasing the knowledge of physicians about the role of alcohol in highway crashes and increasing awareness of ASAP activities. There was no evidence of positive effects on physicians' attitudes or behavior regarding treatment of problem drivers.

by M. M. Chapman; A. C. Wolfe
Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
Contract FH-11-7535
Rept. No. UM-HSRI-AL-73-8 ; 1973 ; 39p
Prepared for the Washtenaw County Alcohol Safety Action Program, Washtenaw County Health Dept., Ann Arbor, Mich.
Availability: NTIS

HS-801 044

WASHTENAW COUNTY GENERAL PUBLIC: 1971 AND 1973 ASAP SURVEYS. FINAL REPORT

Two surveys of driving-age adults in Washtenaw County, Michigan were conducted in 1971 and 1973 as part of the evaluation procedures for the Washtenaw County Alcohol Safety Action Program (WCASAP), designed to give baseline and comparative data on knowledge, attitudes, and behavior concerning alcohol use and driving-after-drinking. Interviews were conducted with 606 respondents in 1971 and 619 in 1973. A substantial increase in reported alcohol use among age groups under 35 is shown, and for the 18-20 age group (newly legalized drinkers) there is shown a considerable increase in reported driving after drinking too much for safe driving. In other age groups, some increase in the use of alternate means of transportation after drinking too much is found. Few significant changes were found in attitude and knowledge aside from an increased awareness of the WCASAP program.

by A. C. Wolfe; M. M. Chapman
Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
Contract FH-11-7535
Rept. No. UM-HSRI-AL-73-9 ; 1973 ; 103p
Prepared for the Washtenaw County Alcohol Safety Action Program, Washtenaw County Health Dept., Ann Arbor, Mich.
Availability: Corporate author

HS-801 045

WASHTENAW COUNTY ATTORNEYS: 1971 AND 1973 ASAP SURVEYS. FINAL REPORT

Surveys of attorneys in Washtenaw County, Michigan were conducted in 1971 and 1973 as part of the evaluation for the Washtenaw County Alcohol Safety Action Program (WCASAP). The surveys were conducted by mailed self-administered questionnaries and were designed to obtain baseline and comparison data on the knowledge, attitudes and behavior of local attorneys regarding the drunk driving problem. Evidence suggesting a positive campaign effect on knowledge and attitudes of attorneys was limited to increases found in favorable attitudes toward the use of alcohol breath tests, knowledge of the safe drinking-before-driving limit, and awareness of the existence of local ASAP activities. Attorneys' direct exposure to WCASAP as defense counsel, prosecutors or judges was considered a potentially more effective agent in producing those changes than the WCASAP campaign.

by M. M. Chapman; A. C. Wolfe
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
Contract FH-11-7535
Rept. No. UM-HSRI-AL-73-10 ; 1973 ; 38p
Prepared for the Washtenaw County Alcohol Safety Action Program, Washtenaw County Health Dept., Ann Arbor, Mich.
Availability: Corporate author

HS-801 046

WASHTENAW COUNTY LAW ENFORCEMENT AGENCIES: 1971 AND 1973 ASAP SURVEYS. FINAL REPORT

Two surveys of Washtenaw County Law Enforcement agencies were conducted in 1971 and 1973 as part of the evaluation procedures for the county Alcohol Safety Action Program (ASAP) public information education campaign. They were designed to obtain baseline and comparison data on the knowledge, attitudes, and behavior of law enforcement officers regarding the drunk driving problem. The overall impact of the campaign is considered minimal. Special training videotapes were viewed by less than 33% of the respondents. Increases were found in knowledge about the extent of alcohol-related fatalities, the limit of drinks for safe driving, and in awareness of ASAP activities; but findings showed that officers retained a traditional attitude toward drunk drivers as violators who should be severely penalized. A tendency toward acceptance of government intervention for treatment of problem drinkers was found.

by M. M. Chapman; A. C. Wolfe
Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
Contract FH-11-7535
Rept. No. UM-HSRI-AL-73-11 ; 1973 ; 36p
Prepared for the Washtenaw County Alcohol Safety Action Program, Washtenaw County Health Dept., Ann Arbor, Mich.
Availability: NTIS

HS-801 047

WASHTENAW COUNTY HIGH SCHOOL STUDENTS: 1971 AND 1973 ASAP SURVEYS. FINAL REPORT

Surveys of senior high school students in Washtenaw County, Michigan, were conducted in 1970-71 and 1972-73 as part of the evaluation for the Washtenaw County Alcohol Safety Action Program. Self-administered questionnaires revealed that alcohol use among high school students increased from 1970 to 1972, from 66% to 76%. The data also indicate greater quantities as well as greater frequencies of consumption in 1972, and 39% of the 1972 respondents reported smoking marijuana and 20% using hashish. Few significant changes in driving-after-drinking behavior and in knowledge and attitudes about drinking and driving were found. Substantial numbers admitted to driving after drinking too much for safe driving, and even larger numbers showed that they were poorly informed about the legal and physiological aspects of drinking and driving.

by A. C. Wolfe; M. M. Chapman
Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
Contract FH-11-7535
Rept. No. UM-HSRI-AL-73-12 ; 1973 ; 135p refs
Prepared for the Washtenaw County Alcohol Safety Action Program, Washtenaw County Health Dept., Ann Arbor, Mich.
Availability: Corporate author

HS-820 194

ALCOHOL SAFETY ACTION PROJECTS. FIRST YEAR EVALUATION PREVIEW

The report focuses on the success of the first eight of the thirty-five ASAPs in meeting three goals: To prove the overall effectiveness of a systematic approach to the problem of drinking-driving by demonstrating that these projects save lives; to evaluate the individual countermeasures within the limits permitted by the simultaneous application of a number of different countermeasures at the same site; catalyze each state into action to improve its safety program in the area of alcohol countermeasures. Evidence that observed reductions in fatal crashes were due to ASAP activities was provided by data which showed that there was a significant reduction in fatally injured drivers with a high blood alcohol content.

by Anonymous
National Hwy. Traf. Safety Administration, Washington, D.C.
1972 ; 37p
Availability: GPO $0.40

HS-820 302

FAILURE INDICES -- NEW IMPROVED MEASURES OF PERFORMANCE

A statistical measure of involvement in motor vehicle accidents has been developed for use in obtaining the relative and absolute performance of various categories of drivers, vehicles, or both. It involves the number of licensed drivers and vehicles by class presumably on the road and designated as trials or exposures, the number of accident involvements designated as failures, and the ratio between the two. Assumptions are made that any failure involves only one or two vehicles, and that only one operator or vehicle is at fault; exceptions are seen as statistically unimportant. Performance data lead to an accident involvement index, which although relative, is considered highly useful. A mathematical model is developed which, given estimates of driving exposure for selected driver-vehicle classes, measures their accident responsibility and therefore their driving performance.

by E. C. Cerrelli
National Hwy. Traf. Safety Administration, Washington, D.C.
1973 ; 54p refs
Includes as appendix B, NBSIR-73-154, A Summary of the Relationships Between Accident Indices and Rates Following a Redefinition of "Failure", HS-013 744.
Availability: Corporate author

SUBJECT INDEX

PERSONAL AUTHOR INDEX

CORPORATE AUTHOR INDEX

CONTROL NUMBER INDEX

CONTRACT CPA-70-44
HS-014 008
CONTRACT DAAE-07-69-0356
HS-014 047
CONTRACT DAAF03-69-C-0014
HS-014 049
CONTRACT DOT-FH-11-7777
HS-014 045
CONTRACT DOT-HS-191-2-301
HS-801 028
CONTRACT DOT-HS-314-3-601
HS-801 010
HS-801 011
CONTRACT EHS-70-102
HS-014 046
CONTRACT FH-11-7399
HS-014 031
CONTRACT FH-11-7535
HS-801 040
HS-801 041
HS-801 042
HS-801 043
HS-801 044
HS-801 045
HS-801 046
HS-801 047
CONTRACT FH-11-7807
HS-014 057
CONTRACT 68-04-0012
HS-014 050
GRANT EPA-R-802466
HS-014 003
GRANT Y-1460
HS-014 080

REPORT NUMBER INDEX

APTD-1154, " 4134-71-72
HS-014 046
APTD-1546, " AT-6100-R8-RFV-1
HS-014 050
RCS-G0331
HS-014 055
CAL-DMV-RSS-73-43
HS-014 054
DOT-OS-20004
HS-014 061
FTD-HT-23-270-72
HS-014 056
NAF-1530
HS-014 052
HS-014 053
PB-225 032, SS-H-25
HS-013 984
PB-226 030
HS-013 991
PB-226 060
HS-013 987
PB-226 891
HS-801 025
SIT-DL-72-1609, " R-1609
HS-014 047
THEMIS-40
HS-014 049
TTI-2-5-69-140-7
HS-014 063
UM-HSRI-HF-TM-73-5
HS-014 060
1727-2, " BMCS-RD-71-2
HS-014 045
4135-496
HS-801 012
AD-741 393
HS-014 049
AD-747 349
HS-014 047
AD-747 386
HS-014 056
AD-763 452
HS-014 055
CHP-7-72-300
HS-014 048
DOT-TSC-NHTSA-73-10
HS-801 020
DOT-TSC-NHTSA-73-12
HS-801 018
GMR-1510
HS-014 062
HS-013 946
HS-013 947
HS-013 948
HS-013 949
HS-013 950
HS-013 951
HS-013 952
HS-013 953
HS-013 954
HS-013 955
HS-013 974
HS-013 975
HS-013 976
HS-013 977
HS-013 978
HS-013 979
HS-013 980
HS-013 981
HS-013 982
HS-013 983
HS-013 984
HS-013 985
HS-013 986
HS-013 987
HS-013 988
HS-013 989
HS-013 990
HS-013 991
HS-013 992
HS-013 993
HS-013 994
HS-013 995
HS-013 996
HS-013 997
HS-013 998
HS-013 999
HS-014 000
HS-014 001
HS-014 002
HS-014 003
HS-014 004
HS-014 005
HS-014 006
HS-014 007
HS-014 008
HS-014 009
HS-014 010
HS-014 011
HS-014 012
HS-014 013
HS-014 014
HS-014 015
HS-014 017
HS-014 018
HS-014 019
HS-014 020
HS-014 021
HS-014 022
HS-014 023
HS-014 024
HS-014 025
HS-014 026
HS-014 027
HS-014 028
HS-014 029
HS-014 030
HS-014 031
HS-014 032
HS-014 033
HS-014 034
HS-014 035
HS-014 036
HS-014 037
HS-014 038
HS-014 039
HS-014 040
HS-014 041
HS-014 042
HS-014 043
HS-014 045
HS-014 046
HS-014 047
HS-014 048
HS-014 049
HS-014 050
HS-014 051
HS-014 052
HS-014 053
HS-014 054
HS-014 055
HS-014 056
HS-014 057
HS-014 058
HS-014 059
HS-014 060
HS-014 061
HS-014 062
HS-014 063
HS-014 064
HS-014 065
HS-014 066
HS-014 067
HS-014 068
HS-014 069
HS-014 070
HS-014 071
HS-014 072
HS-014 073
HS-014 074
HS-014 075
HS-014 076
HS-014 077
HS-014 078
HS-014 079
HS-014 081
HS-014 082
HS-014 083
HS-014 084
HS-014 085
HS-014 086
HS-800 975
HS-800 991
HS-801 008
HS-801 010
HS-801 011
HS-801 012
HS-801 013
HS-801 018
HS-801 019
HS-801 020
HS-801 028
HS-801 029
HS-801 030
HS-801 031
HS-801 032
HS-801 033
HS-801 034
HS-801 040
HS-801 041
HS-801 042
HS-801 043
HS-801 044
HS-801 045
HS-801 046
HS-801 047
HS-820 194
HS-820 302
ISBN-0-88410-301-3
HS-014 029
JHRP-30
HS-014 085
LTR-ST.604
HS-014 052
LTR-ST.638
HS-014 053
NTSB-HAR-73-4
HS-013 984
NYSDOT-ERD-73-RR13
HS-014 058
PB-208 914
HS-014 061
PB-210 836
HS-014 046

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DOT–HS–005–3–686 Mod. 1

DEVELOPMENT OF TEST PROCEDURES FOR TESTING OF VEHICLES FOR CONFORMANCE WITH FEDERAL MOTOR VEHICLE SAFETY STANDARD 124, ACCELERATOR CONTROL SYSTEMS

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Extended to 31 May 74

$16,418.00

Dynamometer conduct demonstration tests of passenger cars, multipurpose vehicles, trucks and buses will be conducted to requirements of Federal Motor Vehicle Safety Standard (FMVSS) Number 124, Acceleration Control Systems. Using a 1973 standard size car, a gasoline truck and a diesel driven truck as the experimental vehicles, evaluation tests will include determination of the throttle return times with engines under normal loads at ¼, ½, ¾, and full throttle setting with both return springs installed, the stronger return spring removed, the weaker return spring removed, and the control system severed at its most critical point.

DOT–HS–027–1–054 Mod. 6

HIGH SPEED PERFORMANCE TEST

General Environments Corporation
6840 Industrial Road
Springfield, Virginia 22151

Extended to 30 June 74

$3,900.00

30 additional tire endurance tests will be performed.

DOT–HS–034–3–535 Mod. 1

TRI-LEVEL STUDY OF THE CAUSES OF TRAFFIC ACCIDENTS

Indiana University Foundation
Box F
Bloomington, Indiana 47401

Phase II—15 Aug 73 to 15 Aug 74
Phase III—15 Aug 74 to 15 Aug 75

$484,400.00

Phases II and III of a three year program will produce a driver knowledge/dynamic vision survey and a report on a minimum of 800 on-site accident investigations. Using the City of Bloomington and Monroe County, Indiana, for the project study, data elements will include: sex and age of licensed drivers; make, model and year of vehicles; number of miles on type of roadway; place of occurrence; light conditions; type and severity of accidents, and violations involved. Objective is to establish a baseline of driver, vehicle and highway accident exposure, and gross accident experience in the study area. A minimum of 800 on-site investigations will be made to assess human, vehicular and environmental factors and to make accident causal determinations.

DOT–HS–046–3–769 Mod. 1

VEHICLE BRAKING SYSTEMS TESTING PROCEDURE—HYDRAULIC BRAKES

Dynamic Science Division
Ultrasystems, Inc.
1850 West Pinnacle Peak Road
Phoenix, Arizona 85027

Extended through 30 June 74

$3,676.00

Original contract is modified to include testing of vehicles with Split Hydraulic Brake Systems.

DOT–HS–120–3–544 Mod. 9

AUTOMOTIVE JACK STANDS SURVEY

Essex Corporation
303 Cameron Street
Alexandria, Virginia 22314

To to completed 1 Mar 74

$2,807.00

Using 5 each of 20 different make jack stands, of the 2 and 3 ton capacity range as sold through discount stores, department stores and automotive supply catalogs, vertical loads are applied in increasing magnitude until the ultimate capacity of the jack is attained. Jack stands are placed on a steel base plate and the load applied by means of a cylindrical shaped mandrel 3 inches long and 2 inches in diameter, to simulate a vehicle axle. Record is made of displacement of

loaded mandrel vs. load applied when peak load is attained and stand collapses. Testing is conducted with load applied through center of stand at highest and lowest adjustment, off center at highest adjustment, and through center at highest adjustment with base plate 5° and 10° off horizontal.

DOT–HS–268–2–517 Mod. 2

SELECTIVE TRAFFIC ENFORCEMENT PROGRAM

Systems Science Development Corp.
A Subsidiary of Planning Research Corp.
7600 Old Springhouse Road
McLean, Virginia 22101

30 Jun 72 to 31 Dec 74

$78,337.00

This modification provides for the continuation of the Selective Traffic Enforcement Program (STEP). Emphasis will be placed on devising extensive evaluation procedures and techniques on all countermeasures employed. More data must be collected on the local level in order to properly evaluate police, judicial, public information, and traffic engineering countermeasures. Quarterly reports are to be submitted and are to include a cost effectiveness analysis of the operational STEP areas. A manual shall be produced emphasizing how STEP programs should be planned to ensure more comprehensive and meaningful evaluations, and will be used as a major input to a planned national seminar on planning, management, and evaluation of specialized traffic programs.

DOT–HS–317–3–608 Mod. 2

TIRE TEST DATA MANAGEMENT SYSTEMS

Control Data Corporation
Professional Services Division
901 South Highland Street
Arlington, Virginia 22204

Extended through 15 Mar 1974

$7,000.00

This modification authorizes the continuation of the computer-based control system for tire test data for the period 22 Jan 74 to 15 Mar 74.

DOT–HS–4–00802 Mod. 1

SAFETY HELMET PERFORMANCE INVESTIGATION

Southwest Research Institute
8500 Culebra Road
San Antonio, Texas 78284

Extended to 1 Apr 74

$2,500.00

Using the basic drop test procedures of Federal Standard 218, Paragraph S7.1, Impact Attenuations Tests, both the flat anvil and hemispherical anvil will be used with their respective drop heights in testing the 12 helmet models already selected under this contract. The models used in this testing will have been exposed to ambient environmental conditions, low temperature (−20° F.), high temperature (122° F.), and water immersion conditions prior to the drop tests. Data shall be reduced in the form of HIC, g, and time durations related to the 150-g, 200-g, and 400-g criteria levels.

DOT–HS–4–00810

MULTIDISCIPLINARY ACCIDENT INVESTIGATION STUDY—GENERAL

University of Utah
Research Institute
520 Wakara Way
Salt Lake City, Utah 84112

13 Mar 74 to 30 Nov 74

$137,700.00

The Contractor will participate in a nationwide program of multidisciplinary investigations of highway traffic accidents. A balanced distribution of fatal, injury producing, and property damage collisions will include an analysis of vehicular, environmental, and human elements of the collisions. Investigation is to be made of all crashes involving passive restraint and/or crash recorder equipped vehicles of the GSA fleet, and of all school bus accidents having 3 or more fatalities, located in the Salt Lake City area. A statewide query regarding ignition interlock systems in 1974 passenger vehicles to determine the use of active restraints will be implemented.

DOT–HS–4–00853

HANDLING TEST PROCEDURES FOR LIGHT TRUCKS, VANS AND RECREATIONAL VEHICLES

Ultrasystems, Incorporated
Dynamic Science Division
1850 W. Pinnacle Peak Road
Phoenix, Arizona 85027

11 Mar 74 to 31 May 75

$263,189.00

The Contractor shall develop, validate, and document a pragmatic and, if necessary, empirical set of dynamic performance tests suitable for making first-order appraisals and evaluations of overall light truck, van, and RV dynamic performance under realistic highway driving maneuvers.

DOT–HS–4–00855

MODULATOR PROGRAM DEVELOPMENT FOR VEHICLE CRASH SIMULATION

University of Michigan
Office of Research Administration
260 Research Administration Building
Ann Arbor, Michigan 48105

4 Mar 74 to 4 Jan 76

$266,140.00

Objective of this program is to create an analytical capability which will satisfy the requirements of a Level Four simulation as outlined in the "Familiarization Study" of Contract DOT–HS–031–2–481, "Modeling, Simulation, and Verification of Impact Dynamics." This capability is to emerge as a modulator computer program which simulates vehicle components to variable degrees of sophistication and conforms with the modeling theory and programming strategy outlined in the reports of the above-mentioned contract.

DOT–HS–4–00860

ACCIDENT AVOIDANCE AND CRASH TESTING OF EXPERIMENTAL VEHICLES

Ultrasystems, Incorporated
The Dynamic Science Division
1850 Pinnacle Peak Road
Phoenix, Arizona 85027

27 Feb 74 to 27 May 75

$579,840.00

This study will outline the quantitative nondestructive and crash testing of foreign prototype Experimental Safety Vehicles (ESV's). Established test procedures on vehicle dimension and weight, brakes, yaw response, fixed control lateral acceleration, flat barrier impacts, and front end crashes will be used to test vehicle performance against major requirements in the ESV performance specification, and to assist in the definition and solution of problems associated with traffic mix, car-to-car compatibility, and aggressiveness. Additional guidelines to be used are Highway Safety Research Institute (HSRI) procedures for sinusoidal steer test, trapezoidal steer test, and drastic steer and brake test.

DOT–HS–4–00861

USE OF ACCIDENT DATA IN STANDARDS COMPLIANCE PROGRAM

Regents of the University of Michigan
260 Research Administration Building
Ann Arbor, Michigan 48105

1 Feb 74 to 30 Apr 74

$22,420

Recommendations will be made for specific changes in the way that the National Highway Traffic Safety Administration (NHTSA) now collects and processes accident data on passenger cars, trucks, multi-purpose vehicles, buses and motorcycles and uses that data in the standards enforcement program. The major objective is to ensure that the NHTSA standards compliance program makes the most effective use of accident data and to ensure that the accident investigation and data collection programs will supply the information needed for the compliance program. The strategy and the tactics which are presently used by the Office of Standards Enforcement (OSE) to secure compliance with the safety standards will be examined and recommendations for improvement will be made.

DOT–HS–4–00864

SPECIFICATION OF CONTROL ILLUMINATION LIMITS

Wayne State University
Detroit, Michigan 48202

28 Feb 74 to 16 Aug 74

$33,657.00

Motor Vehicle Safety Standard No. 101 presently requires that certain controls be identified and illuminated whenever the headlamps are activated. A quantitative study will be made to determine the high and low limits of such controls. Methods and instrumentation for assessing these limits will be developed. The problem of finding and identifying the controls at the low illumination level is a problem, while at the high level of illumination in-vehicle glare is of particular interest.

DOT-HS-4-00865

FABRICATION OF A STANDARD BENCH VEHICLE SEAT

University of Michigan
260 Research Administration Building
Ann Arbor, Michigan 48105

5 Mar 74 to 5 July 74

$19,470

A standard vehicle seat simulator of full bench configuration will be built to be used as a standard base on which to mount child restraints in dynamic sled tests. Replacement seat and back cushions will be fabricated of vinyl-covered, polyurethane foam which may be installed after each test to assure uniformity of mounting base performance.

DOT-HS-4-00869

LABOR HOUR CONTRACT FOR CODING, EDITING AND KEYPUNCH

Opportunity Systems, Inc.
1330 Massachusetts Avenue, N.W.
Washington, D.C. 20005

4 Feb 74 to 30 Sep 74

$18,789.91

Coding, editing and keypunch services for the Financial Management Information and Accounting System (FMIAS), National Highway Traffic Safety Administration (NHTSA) will be performed. Coding sheets will be provided one to two times weekly. Contractor will provide pickup and delivery services to FMIAS with turn-around time 24 hours from the scheduled pickup.

DOT-HS-4-00870

PITMAN ARM STUDY

Syracuse University
Office of Sponsored Programs
Skytop Office Building/Skytop Road
Syracuse, New York 13210

19 Mar 74 to 30 Apr 74

$4,483.00

Review of previous testing and examination of the Pitman Arm will be effected. Strength, ductility, and toughness will be determined and results of metallurgical and stress analysis provided. Conclusions concerning failure modes will be formulated.

DOT-HS-4-00871

OPERATION AND MAINTENANCE OF THE COMBINED OSE PERIODIC REPORTS SYSTEM AND TIRE TEST DATA MANAGEMENT SYSTEM

Control Systems Research, Inc.
1515 Wilson Boulevard
Arlington, Virginia 22209

15 Mar 74 to 15 Mar 75

$62,533

Operation and maintenance of a computer application for the Office of Standards Enforcement (OSE) Test Tire Data Management System and the Periodic Records System shall be provided. Reports on testing and retesting of new and retreaded pneumatic tires for passenger cars and new pneumatic tires for vehicles other than passenger cars by independent testing laboratories will be monitored and inspected. Information on results of each validated tire test will be placed in a computer based history file. Reports on tires tested will be submitted to OSE showing manufacturer, brand, tire name, and tire size. This will be done on a predetermined schedule established by OSE. Special data studies utilizing the existing Tire Test Report data base will be submitted upon request. The OSE Computerized Reports System as now established will be continued. Review of each new FMVSS with an effective date prior to 15 March 1975, for purposes of determining failure modes will be made by the Contractor and reported to OSE.

DOT–HS–4–00872

SPILLED FUEL IGNITION SOURCES AND COUNTER-MEASURES

Ultrasystems, Incorporated
The Dynamic Science Division
1850 Pinnacle Peak Road
Phoenix, Arizona 85027

20 Mar 74 to 15 Mar 75

$89,559.00

An effort is to be made through experimental research and testing to determine the current state-of-the-art ignition source research as it pertains to motor vehicle spilled fuel fire and explosion problems, their associated ignition sources and available countermeasures to both ignition and fuel spillage.

DOT–HS–4–00873

PERFORMANCE EVALUATION OF THE HYBRID II TEST DUMMY

Calspan Corporation
Post Office Box 235
Buffalo, New York 14221

4 Mar 74 to 31 May 75

$4,981.00

Repeated tests are to determine the variability of performance of certain components of the Hybrid II test dummy. Data on the scatter of test dummy response of the thorax, the lumbar spine, and the knees under impact conditions is of primary interest.

DOT–HS–00817

HANDBOOK FOR DEVELOPING SAFETY DRIVING KNOWLEDGE DISSEMINATION AND TESTING TECHNIQUES FOR LICENSE APPLICANTS

Central Missouri State University
Warrensburg, Missouri 64093

28 Feb 74 to 31 Aug 75

$242,515.62

The primary product of this contract will be the development of a handbook for implementing and evaluating safe driving knowledge delivery and testing systems. This handbook will contain relevant material for development of a safety performance oriented driver's manual, the appropriate testing devices and items, and guidelines for the development of other approaches to enhance safe driving knowledge of the State's driving population. An evaluation of special techniques to disseminate driver knowledge information and to test driver knowledge by means other than the traditional manual and written tests will be made. Search of traffic safety literature with attention on teaching considerations and legal constraints relative to driver manuals will aid in development of tailored driver's manuals for Class "C" license applicants. The Contractor will revise the safe driving manual, develop instructions for the dissemination of materials to the experimental license applicants, develop a control procedure to ensure that appropriate manuals get to proper applicants and print manuals to distribute to experimental groups. Evaluation will be made as to whether the capabilities of a safe driving manual together with an improved driver knowledge test can have a beneficial effect in reducing the number and severity of accidents, and, by analyzing traffic violations, the inefficiency of highway traffic system operations.

DOT–HS–00849 Mod 1

CONTRACT TECHNICAL MANAGEMENT SEMINAR

Sterling Institute
2600 Virginia Avenue, N.W.
Washington, D.C. 20037

21 Jan 74 to 2 May 74

$3,506.00

The modification provides for a fifth 4-day training seminar to be held for NHTSA Contract Technical Managers. The course is designed to cover the role and responsibilities of such personnel throughout the procurement process, with emphasis on work statements, competition, contract awards, evaluation criteria, contract development and contract administration.

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517